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UNIVERSITY OF SOUTHAMPTON

FACULTY OF SOCIAL AND HUMAN SCIENCES

Social Statistics and Demography

**Measuring people's knowledge and exploring the use of this measure for
policies: assessing healthcare professionals' knowledge about
Sudden Infant Death Syndrome (SIDS) and its risk factors**

by

Federico de Luca

Thesis for the degree of Doctor of Philosophy

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UNIVERSITY OF SOUTHAMPTON

ABSTRACT

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**MEASURING PEOPLE'S KNOWLEDGE AND EXPLORING THE USE
OF THIS MEASURE FOR POLICIES: ASSESSING HEALTHCARE
PROFESSIONALS' KNOWLEDGE ABOUT SUDDEN INFANT
DEATH SYNDROME (SIDS) AND ITS RISK FACTORS**

by Federico de Luca

This thesis focuses on how it is possible to measure people's knowledge on a topic where certain statements can effectively discriminate between knowledgeable and non-knowledgeable people. It presents an application in measuring healthcare professionals' knowledge about Sudden Infant Death Syndrome (SIDS) and its risk factors.

Identifying the best and worst prepared healthcare professionals allows policymakers to reconsider the structure of their healthcare system and to implement targeted training initiatives about this topic.

To do so, this research uses data belonging to the SIDS Project, a project meant to provide the first data about this topic in the United Kingdom and Spain. The mail survey referring to the United Kingdom was carried out in the South Central Strategic Health Authority in 2012, while the Spanish one was carried out in the provinces of Barcelona, Lérida and Tarragona in 2012 and 2013. The target population for the British survey consisted of general practitioners (GPs), while the target population for the Spanish survey consisted of paediatricians. Moreover, data about Italy were also available, which allowed cross country comparisons involving three different realities.

This research shows that the Back-To-Sleep (BTS) message seems to have been effectively adopted by the British GPs, but, surprisingly, not as well received by the Spanish and Italian paediatricians. In the first case, in fact, more than 90% of the respondents recommended parents the supine position exclusively. In Spain and Italy, instead, this percentage was of 58% and 69% respectively. By contrast, instead, the whole SIDS prevention message seems to have been better received in Spain and Italy than in the United Kingdom. British policymakers should reconsider the role of GPs in terms of delivering parents the BTS message, as they were found to be quite prepared. Spanish and Italian policymakers, instead, should try to increase the degree of adoption of the BTS message among their healthcare professionals. In particular, Spanish policymakers should urgently intervene in order to clarify that the supine position is the only one that can be deemed to be a protective factor against SIDS.

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DECLARATION OF AUTHORSHIP

I, Federico de Luca

declare that the thesis entitled

Measuring people's knowledge and exploring the use of this measure for policies: assessing healthcare professionals' knowledge about Sudden Infant Death Syndrome (SIDS) and its risk factors

and the work presented in the thesis are both my own, and have been generated by me as the result of my own original research. I confirm that:

- this work was done wholly or mainly while in candidature for a research degree at this University;
- where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
- where I have consulted the published work of others, this is always clearly attributed;
- where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
- I have acknowledged all main sources of help;
- where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
- parts of this work have been published as:
 - de Luca F. and Boccuzzo G. (2013) What do healthcare workers know about sudden infant death syndrome?: the results of the Italian campaign 'GenitoriPiù', *Journal of the Royal Statistical*

Society: Series A (Statistics in Society), DOI: 10.1111/j.1467-985X.2012.01081.x;

- Boccuzzo G. and de Luca F. (2012) Sudden infant death syndrome: knowledge of its risk factors among Italian healthcare professionals, *Electronic Journal of Applied Statistical Analysis*, 5(3), pp. 374-380.
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Signed:

Date:

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Definitions and Abbreviations

AAP = American Academy of Pediatrics

AEP = Spanish Association of Paediatrics (Asociación Española de Pediatría)

ASL = Local Health Authority (Azienda Sanitaria Locale)

BTS = Back-To-Sleep

CI = Confidence Interval

COMB = Col·legi Oficial de Metges de Barcelona

CPC = Category Probability Curves

CPD = Continuous Professional Development

ECG = Electrocardiogram

GP = General Practitioner

ICC = Intraclass Correlation Coefficient

ICC² = Item Characteristic Curve

IP = Index of Preparation

IRT = Item Response Theory

ISPID = International Society for the Study and Prevention of Perinatal and Infant Death

IU = Index of Unpreparedness

MAR = Missing At Random

MCAR = Missing Completely At Random

NA = Not Applicable

NHS = National Health Service

NICU = Neonatal Intensive Care Unit

OR = Odds Ratio

RR = Relative Risk

RSM = Rating Scale Model

SIDS = Sudden Infant Death Syndrome

TDM = Tailored Design Method

WTV = Wald Test Value

1. Description of the PhD

1.1. Introduction

Being able to assess underlying variables of interest has always been a fascinating challenge that was met in many different fields. An example of an underlying variable that has often been investigated is what could be defined as '*intelligence*', something that can be intuitively understood but which is also hard to measure objectively. Underlying variables identify concepts rather than physical dimensions, and psychometricians define them as unobservable, or latent, traits. Due to their peculiar nature, the only way to measure these variables is to use the information given by some other measurable variables that are believed to be determined by the same latent trait.

In this PhD project the latent trait of interest is what we could call '*knowledge*' rather than '*intelligence*'. In fact, the focus will be on how to assess people's knowledge about a topic where this '*knowledge*' can be exhaustively described by a series of different items. These items do not need to have the same importance in describing the latent trait, but they all need to concur in building up the idea of a '*knowledgeable*' respondent. Of course, for each of these items there also needs to be a correct answer.

Readers will be presented with an application of this approach to the context of Sudden Infant Death Syndrome (SIDS), a syndrome whose causes are still unknown and a topic where, in the last 30 years, epidemiological investigations brought many changes in what could be defined as best practice. Being able to measure healthcare professionals' knowledge about this topic will enable policymakers to make informed decisions about the training process of healthcare professionals and about the structure of their healthcare system.

Moreover, apart from the potential consequences on local healthcare policies, this study is not intended to limit its conclusion to a topic that purely relates to SIDS. In fact, it also aims to present a more general contribution regarding the training process of personnel and how to evaluate it. In particular, it aims to implement a simple but effective procedure to measure personnel's knowledge of a given topic, which will be applicable to a much

wider range of similar issues from different fields. For example, it may be useful in describing the degree of awareness that users/consumers have of all the possible applications and potential of a given product, and how this awareness varies among them.

1.2. Background

SIDS, also commonly known as '*cot death*' or '*crib death*', is one of the major causes of death in the post-neonatal age (from 1 to 12 months) in developed countries, and the major cause of death if only healthy born infants are considered. SIDS is defined as '*the sudden unexpected death of an infant <1 year of age, with onset of the fatal episode apparently occurring during sleep, that remains unexplained after a thorough investigation, including performance of a complete autopsy and review of the circumstances of death and the clinical history*' (Krous et al., 2004). SIDS occurs less frequently in the first month of life, it reaches its peak between ages 2-4 months and then it decreases. Around 90% of SIDS deaths happen in the first 6 months of life, and almost two thirds of the cases happens at night, with boys that are more likely to die than girls (at a ratio of 60:40) (A.D.A.M. Medical Encyclopedia, 2011; Moon et al., 2007a; Williams et al., 2002).

Nowadays, SIDS impact can be estimated at between 0.08 and 0.43 deaths per 1,000 infants (Centraal Bureau voor de Statistiek, 2013; Hoyert and Xu, 2012). However, rates are now much lower than formerly (Table 1.1), and this is due to the effect of the Back-to-Sleep prevention campaigns. Since 1987, in fact, these campaigns have been run in most developed countries and aimed at raising awareness of the most important risk factor for SIDS: the sleep position. The objective of these campaigns was to increase the percentage of parents that put their babies to sleep in the supine position, which is the safest position for preventing SIDS (Ponsonby et al., 1998).

Despite its importance, nowadays the cause of SIDS is still unclear (Lavezzi and Maturri, 2008; Arnestad et al., 2007; Wang et al., 2007). Many hypotheses have been advanced, but the shared belief is that it might have a multifactorial cause which has not yet been entirely explained (Mitchell, 2009a). Due to this uncertainty, so far it is not possible to take action that will definitely prevent SIDS. As a result, great attention has been given to epidemiological findings

about it, so that, even if its causes are still unknown, it is possible at least to implement some active interventions to reduce its risk (see Section 2.2).

Table 1.1. SIDS rate in 1987 (per 1,000 healthy born infants), the year when the BTS campaigns began, and the most recent SIDS rate (with reference year) for the 12 most populated developed countries

Country	SIDS rate in 1987	Year when the BTS campaigns began	Most recent SIDS rate and year of reference
Australia	2.49 ¹	1991 ²	0.30 ₍₂₀₁₁₎ ⁶
Canada	1.06 ¹	1993 ²	0.30 ₍₂₀₀₉₎ ⁷
France	1.85 ¹	1994 ²	0.28 ₍₂₀₁₀₎ ⁸
Germany	1.64 ¹	1991 ²	0.22 ₍₂₀₁₁₎ ⁹
Italy	0.11 *	2008 ³	0.04 ₍₂₀₀₉₎ *
Japan	0.10 ¹	1998 ²	0.13 ₍₂₀₁₁₎ ¹⁰
Netherlands	0.91 ¹	1987 ²	0.08 ₍₂₀₁₁₎ ¹¹
Poland	0.26 *	Not available	0.22 ₍₂₀₀₉₎ *
South Korea	Not available	Not available	Not available
Spain	0.30 *	2000 ⁴	0.12 ₍₂₀₁₀₎ *
United Kingdom	2.40 ¹	1991 ⁵	0.40 ₍₂₀₁₁₎ ¹²
United States	1.37 ¹	1994 ²	0.43 ₍₂₀₁₁₎ ¹³

¹ Camarasa Piquer, 2003.

² International Society for the Study and Prevention of Perinatal and Infant Death, 2013.

³ Campagna Genitori Più, 2009.

⁴ Cardesa García et al., 2003.

⁵ Southall and Samuels, 1992.

⁶ Australian Bureau of Statistics, 2013.

⁷ Statistics Canada CANSIM (database), 2013.

⁸ Centre d'épidémiologie sur les causes médicales de décès (CépiDc), 2013.

⁹ Statistisches Bundesamt (DESTATIS), 2013.

¹⁰ Ministry of Health, Labour and Welfare, 2013.

¹¹ Centraal Bureau voor de Statistiek, 2013.

¹² Eurostat, 2013.

¹³ Hoyert and Xu, 2012.

* The rates for Italy, Poland and Spain referred to 1994 and were estimated by combining data about causes of death and number of healthy born children retrieved on the websites of their national statistical institutes (ISTAT, GUS and INE). Because of the lack of a homogenous detection process, these estimates are likely to be underestimated (Camarasa Piquer, 2003).

Newborns' parents are the persons in charge of the implementation of these interventions, as all of them are to be put into practice at home during everyday life. In order to reduce SIDS risk in the population, then, it is essential that parents receive the best and most up to date information about this topic.

Nowadays it cannot be expected that parents would get and would try to gather this information through only one source. On the contrary, they might try to gather this information through several sources (e.g. friends, books, the internet, etc.). However, it is likely that their main source of information would still be the healthcare professionals they deal with. And even if healthcare professionals were as well prepared as possible in terms of knowledge, it cannot be assumed that their communication skills will be completely effective in conveying the message successfully to newborns' parents. Similarly, it cannot be assumed that all parents will be able to decode the message in the correct way. While the first issue might be addressed with specific training initiatives, it is hard to imagine how policymakers can influence parents' decoding skills. In the best case, they could struggle to formulate the message such that it can be successfully conveyed to persons whose decoding skills are limited.

1.2.1. The role of healthcare professionals

The role played by healthcare professionals is consequently crucial. In fact, they represent one of the most important links in the chain of knowledge linking the latest scientific evidence and parents. Their mission is to explain to parents the effective implementation of measures to actively prevent SIDS. As a consequence, their knowledge must be as correct and aligned with the latest scientific evidence to the greatest extent as possible. In this context, it is important to be able to evaluate the healthcare professionals' training process and to let policymakers know whether it is necessary to improve it or whether its mechanisms are already effective. In other words, it is important to assess what kind of response parents get from healthcare professionals when they ask questions about SIDS (given that it cannot be assumed *a priori* that this information would be very good).

As it will be described in Section 2.5 (page 23), over time there have been several changes in the best practice for SIDS prevention, some of which have involved even the most important risk factors. These changes help to focus the attention on the need for healthcare professionals' knowledge to be extremely up to date. SIDS and its aetiology, in fact, are still *works in progress*, and the latest scientific findings may introduce new risk factors or change the evaluation of previously established ones. As a consequence any significant

new finding has to be effectively transmitted to all the healthcare professionals who daily deal with this topic.

Furthermore, it is important to remember that, by the end of the 1990s, 21% of newborns' parents stated that they did not receive any information about SIDS (Willinger et al., 2000). Given the importance of this topic, such a percentage is worrying. Even if we assumed that this percentage would have decreased in the last years, an assumption which is not confirmed by empirical evidence (Moon and Omron, 2002), any percentage far from 0% would still expose to unnecessary risks a significant number of newborns. Obviously, healthcare professionals will be a privileged target of policymakers' actions when trying to reach the remaining share of parents, and efforts should be dedicated to check, and eventually improve, their knowledge about SIDS.

Moreover, as Raydo and Reu-Donlon pointed out in 2005, healthcare professionals '*have a responsibility to use the most current research to guide practice*', because it has been widely proved that what they recommend to parents, and what parents see that they are doing during their daily practice, have a great influence in the subsequent parents' behaviour at home (Raydo and Reu-Donlon, 2005). For this reason, besides the focus on their knowledge, it was decided to investigate also healthcare professionals' recommendations to parents about sleep position, and how these two aspects interact between each other.

1.3. Aim of the study

The aim of this study is to analyse healthcare professionals' knowledge and behaviour about SIDS and its risk factors on the basis of their personal and contextual characteristics. If this objective is achieved effectively, it will allow many subsequent important analyses and inform policy in the following areas: (1) the identification of those healthcare professionals who are better prepared on this topic (who can be entrusted with the task of educating the parents of newborn infants); (2) the identification of the less prepared healthcare professionals (who, if deemed necessary by policymakers, can be targeted for additional training sessions); (3) understanding the quality of the information that newborns' parents receive when they ask healthcare professionals questions about this topic; (4) the evaluation of the effectiveness of the healthcare professionals' training process; (5) getting an estimate of the

knowledge of SIDS and its risk factors among the population of newborns' parents.

Despite points (1)-(4) could be easily explored in a study about knowledge and behaviours about SIDS and its risk factors, the majority of the studies on these topics decided to focus on point (5). Moreover, most of them adopted a '*direct approach*' to estimate the population's knowledge, which means that they looked almost exclusively at parents' knowledge about this topic (e.g. Von Kohorn et al., 2010; Epstein and Jolly, 2009; Pastore et al., 2003; Moon and Omron, 2002; Kahn et al., 2001; Gibson et al., 2000; Willinger et al., 2000; Colson et al., 2000; Ottolini et al., 1999; Willinger et al., 1998; Brenner et al., 1998; Lesko et al., 1998; Gibson et al., 1995). A number of studies using the '*indirect approach*' have been carried out in the United States, but only one study have been carried out in Europe (de Luca and Boccuzzo, 2013) and only four in other parts of the world (Yikilkan et al., 2011; Young et al., 2010; Young and O'Rourke, 2003; Young and Schluter, 2002).

The differences between the '*direct*' and the '*indirect*' approach are many:

(a) It is much harder to gather a proper sampling list when adopting the direct approach. In fact, while the complete list of healthcare professionals of an area should exist and be kept up to date by the local health authority, no assumption can be made about a comprehensive list of newborns' parents. This problem could be avoided by devising a multistage sampling design which could account for sites (e.g. hospitals, etc.), time slots (of the year) and characteristics of newborns' parents (such as age or race). However, this kind of sampling design would greatly increase the cost of the survey (both in terms of economic resources and in terms of time). In fact, it requires a higher degree of involvement by researchers, staff at the chosen sites and policymakers, and a much more complex organization of the survey itself.

(b) When choosing the indirect approach, the timing of the survey is not as important as it is in the case of the direct one. In the first case, in fact, the only issue is the avoidance of periods of extremely intense or low activity for healthcare professionals (such as flu peaks or summer). In the second case, instead, it is harder to define how the survey should be run, if taking into consideration factors relating to the parents (such as the working year) or the newborns (such as the age in months).

(c) The target population's size is much bigger with the direct approach, as the list of newborns' parents would be much bigger than the list of the healthcare professionals dealing with them.

(d) The pace of change of the target population is much higher when adopting the direct approach. The healthcare professionals' population, in fact, will likely have changed rather little between year t and $t+1$, as there will be a high degree of overlap. The newborns parents' population, instead, will be (and their knowledge may be) dramatically different from one year to the other, as it is naturally characterized by a high turnover rate. As a consequence, it would be more difficult to establish, or make relevant, the concept of '*current state of affairs*' if focusing on the newborns parents' population.

(e) As a consequence of point (a) and (d), the costs of the study would be much higher with the direct approach than with the indirect approach. The difference in costs, in fact, depends on the need of adopting an expensive and complex survey design (point (a)). Moreover, considering the overall aim of the study (helping policymakers make informed decisions when adopting new policies), the choice of newborns' parents as the target population would imply repeating the survey much more often. This would be necessary in order to take into account the quick changes that could occur every few years (or months) in this population (point (d)), and it would exponentially increase the overall cost of the study.

(f) Should an unsatisfying degree of knowledge among the population emerge, the direct approach would not be able to give policymakers many hints about the specific areas in which they could intervene to improve it (beside details of the population groups with lower knowledge). Instead, the indirect approach would provide data and suggestions about the weaknesses of the chain linking the latest scientific evidence and parents that most need to be addressed. Generalizing, the direct approach allows the precise evaluation of the target population's knowledge and behaviour about SIDS and its risk factors, while the indirect one provides policymakers with an evaluation of the effectiveness of the whole healthcare professionals' training process (Lahr et al., 2005). This is important, because, from a policymaker's perspective, a consequent investment in healthcare professionals' training is both cheaper and more efficient than an investment in courses to be delivered to newborns' parents. Much like the surveys, in fact, these courses would need to be entirely

repeated every few months, while initiatives meant for healthcare professionals could have longer intervals between them (see point (d)).

(g) The biggest advantage of the direct approach, as the name suggests, is that it evaluates precisely the target population's knowledge and behaviour about SIDS and its risk factors, while the indirect approach can only provide estimates of these quantities to the researchers.

The indirect approach was chosen in this study on the basis of all the advantages that were listed above, but the key motivation is point (f). It is essential, in fact, to be able to provide policymakers with detailed information on as many aspects of the training process as possible, so that they may be able to take informed decisions in case they recognize the need to intervene on it (see the work of Lahr and colleagues where they investigated the knowledge possessed by newborns' parents on infant positioning depending on the healthcare structure to which they referred to for prenatal care – Lahr et al., 2005). A simple evaluation of the outcome of a training process would just not be enough to achieve this. Moreover, even if the indirect approach does not allow any direct measure of newborns' parents, once the proper instruments are used and all the recognised statistical standards are followed, the direct estimates of the healthcare professionals' knowledge and behaviours about this topic should represent a good proxy for them.

The motivation of this study is to bridge the existing gap about healthcare professionals' knowledge and behaviours about SIDS and its risk factors, in order to gather more information on this topic and to allow the drawing of the first comparisons about the effectiveness of the healthcare professionals' training process across Europe. The methodological approach that will be presented in order to fill this gap does not use new techniques, but the combination of existing methods (some of which are quite recent) that will be presented to the reader can be defined as innovative and original.

1.3.1. The research hypotheses

The research hypotheses that underlie this study are the following:

1. The healthcare professionals' training process slowly adapts itself to the rate of change of scientific knowledge, not providing training as frequently, or in a sufficiently timely fashion, as it should because its infrastructure may not allow sufficient flexibility for this to be achieved. As a

consequence, healthcare professionals do not necessarily receive training soon after major changes in clinical practice are introduced, or major new breakthroughs in research announced.

2. Healthcare professionals' knowledge and behaviour are not up to date with the latest scientific evidence. As a consequence, healthcare professionals whose last training on a specific topic is further from the present time will show worse knowledge and behaviour than those healthcare professionals who more recently received training.
3. Healthcare professionals' knowledge and behaviour on a specific topic are not uniformly distributed across different generations, because the courses that they attended about this topic changed their content as epidemiological research advanced. In other words, healthcare professionals' training consists of (at least) two elements: the basic university training and the Continuous Professional Development (CPD). Clearly, basic university training is only undergone once, and may be substantially out of date for older professionals. CPD should keep them up to date, but is not always undertaken regularly and at the appropriate time. The generational effect in this hypothesis is really about the tendency for basic university training to become progressively more out of date. Hypothesis (2), on the other hand, is about CPD and how frequently healthcare professionals attend CPD courses.
4. Healthcare professionals who completed further additional training in paediatrics and child health have an overall better knowledge and behaviour about SIDS and its risk factors.
5. Healthcare professionals who have a better knowledge about SIDS and its risk factors also have better behaviours about this topic (especially in terms of recommendations given to parents).

1.4. Description of contents

Chapters 4 to 8 consist of standalone papers that have been written while developing this PhD project. For an easier reading, some of the contents of these chapters have been taken out and grouped together in Chapter 2 and Chapter 3.

Chapter 2 describes the background that will be shared by all chapters in terms of SIDS prevention. It outlines and explains the meaning of the SIDS prevention message by presenting the best practice and all the recognized risk factors for SIDS. The changes that occurred in the best practice over the last two decades and the importance of the healthcare professionals' influence on parents' behaviour are also discussed in Chapter 2.

Chapter 3 gives a description of the SIDS Project and of its surveys. Specifically, it introduces the SIDS Project and explains how it was planned to assess healthcare professionals' knowledge, why the mailing survey was chosen as main survey mode, how the surveys were designed and how the questionnaire was drafted (both in terms of content and of visual presentation). Moreover, Chapter 3 describes how the surveys were implemented and introduces the first results of the British and Spanish surveys.

Chapter 4 was written together with Dr Andrew Hinde and describes a literature review of what has been done so far in terms of assessing healthcare professionals' knowledge about SIDS and its risk factors. From Chapter 4 it emerges that the correctness of healthcare professionals' knowledge and recommendations about the supine sleeping position increased over the last 20 years. However, the percentage of those aware that parents should avoid putting their babies to sleep in a prone position has been decreasing over time: from about 97% in the 1990s to less than 88% at the end of the 2000s. As a consequence, the effectiveness of the Back-to-Sleep (BTS) campaigns in publicizing the benefits of the supine position is confirmed, even if the decrease in the knowledge about non-prone positions suggests that they may have focused excessively on the advantages of the supine position and not enough on the dangers of the prone one.

Dr Hinde contributed as an independent reviewer in selecting the studies of interest and in assessing their quality. He also contributed to the interpretation of the results and to the final draft of the paper. The first draft of the paper and the data analysis were entirely done by me.

- A revision of Chapter 4 has been resubmitted and is currently under review by the *Archives of Pediatrics & Adolescent Medicine*.

Chapter 5 was written together with Dr Vladimiro Vida following the structure of the majority of the studies reviewed in Chapter 4. Most of these

studies, in fact, focussed exclusively on healthcare professionals' knowledge and recommendations about the supine position. In this chapter it is possible to see the first results of the GenitoriPiù campaign. This was a national campaign which was carried out in Italy from 2007 to 2009 and was aimed at promoting simple actions proven effective for the prevention of major childhood risks. The prevention of SIDS was one of the interventions composing the core messages of the campaign. In this chapter we present the first results of a survey which involved about 6,000 healthcare professionals and investigated healthcare professionals' knowledge and recommendations about infants' sleep position. Among these results it is shown how paediatricians (who are the most important source of information for parents) are more likely than all the other healthcare professionals to have a correct knowledge and give correct recommendations about the infants' sleep position. On the other hand, healthcare professionals belonging to medical clinics, hospitals, districts, and departments of public health present worse results than all other healthcare professionals. Geographical differences also exist, with healthcare professionals from the North of Italy performing better than those from the Centre and the South and Islands. Despite an overall satisfying degree of knowledge about the infants' sleep position, the results show the need of further efforts for raising the percentage of professionals recommending exclusively the supine sleep position.

Dr Vida contributed to the final draft of the paper. The first draft of the paper, the data analysis and the interpretation of the results were entirely done by me.

- Chapter 5 is currently under review by *Minerva Pediatrica*.

Chapter 6 combines two papers written together with Dr Giovanna Boccuzzo and describes an extensive analysis of the data gathered by the GenitoriPiù campaign. After an introductory preliminary analysis, in this chapter we build an index of preparation and an index of unpreparedness and model them according to healthcare professionals' background characteristics. From this chapter we can see that significant differences among regions are evident, and how the effect of training initiatives is confirmed to be a successful way to rectify them. Moreover, in terms of professional background, it is found that the best-prepared healthcare professionals are the paediatricians and the healthcare professionals working in birth centres and family planning clinics.

Dr Boccuzzo contributed to the interpretation of the results, to the application of the quantile regression and of the tests related to it. The first and final draft of the paper and rest of the data analysis were entirely done by me. The chapter was sent for English proof-reading.

- The preliminary analysis included in Chapter 6 has been published by the *Electronic Journal of Applied Statistical Analysis*, while the rest of the chapter has been published by the *Journal of the Royal Statistical Society – Series A*.

Chapter 7 was also written together with Dr Boccuzzo and analyses the data resulting from the British survey. In this chapter we investigate if British general practitioners (GPs) know that the supine sleep position alone is the best to reduce the risk of SIDS on the basis of their demographic and professional background. We also assess GPs' overall level of knowledge about all SIDS risk factors and investigate if they recommend exclusively the supine sleep position to newborns' parents. The variables gender, age, having children, number of practices where the GP works and direct experience of a case of SIDS turn out to be the strongest determinants in our analyses. Significant differences among regions also emerge and are likely to be the result of training and prevention campaigns undertaken in some of these regions.

Dr Boccuzzo contributed to the interpretation of the results, to the application of the quantile regression and of its tests and to the application of the sample selection model. The first and final draft of the paper and the rest of the data analysis were entirely done by me.

- Chapter 7 is currently under review by *Health Policy*.

Chapter 8 was written together with Dr Josep Arimany Manso and Dr Esperanza Gómez Durán and introduces the data resulting from the Spanish survey. In this chapter it emerges that paediatricians discuss with parents issues about SIDS less often than it was expected. However, besides any speculation about how often they discuss these issues with parents, what emerged to be a critical situation is that less than 60% of the respondents recognise the supine position as the safest position against SIDS or recommend exclusively the supine position to parents. In both cases, a significant proportion of respondents believe that the lateral position may also be deemed acceptable. Such a result is surprising as it comes from a highly

qualified population (paediatricians) who might be expected to be aware of the latest research into SIDS risk factors (as it was found in the Italian campaign). The most immediate consequence of such behaviour is that a significant proportion of children are unnecessarily exposed to risky situations, and this situation needs to be changed as soon as possible. In terms of overall knowledge of the SIDS prevention message, instead, paediatricians' knowledge can be deemed to be satisfactory, but this does not mean that efforts should not be made to improve it, in particular with training courses that should especially target those paediatricians with higher seniority.

Chapter 9 introduces the first preliminary cross country comparisons between the British, Spanish and Italian surveys. From this chapter it emerges that the BTS message seems to have been effectively adopted by the British GPs, but, surprisingly, not as well received by the Spanish and Italian paediatricians. British policymakers should reconsider the role of GPs in terms of delivering parents the BTS message, as they were found to be quite prepared about this topic. The degree of adoption of the BTS message in Spain and Italy, however, is still lower than expected, and this situation needs to be corrected by policymakers. In particular, Spanish policymakers should urgently intervene in order to clarify to their paediatricians that the supine position is the only one that can be deemed to be a protective factor against SIDS. By contrast, the whole SIDS prevention message seems to have been better received by Spanish and Italian paediatricians than by the British GPs.

Chapter 10 presents the conclusions that were achieved by this research by contrasting the results that were introduced in the chapters 4-9 with the research hypotheses presented in Chapter 1.

Chapter 10 also indicates the limitations of this project and, furthermore, what could be done in the future to improve it and reach wider and more detailed results.

2. SIDS and its prevention

2.1. Introduction

The purpose of this chapter is to give a wide overview about SIDS and the research that has been done over the years in order to prevent it.

The reader will be presented with the history of SIDS, the actual best practice in terms of SIDS prevention and the changes that occurred to it over the years (something that reinforces the need of an updated training process for healthcare professionals).

By the end of the chapter, the influence of healthcare professionals on parents' behaviour will also be discussed. The aim of this discussion is to underline the importance of the relationship between these two groups of people in terms of SIDS prevention. In order to avoid confusion, it is worthy pointing out that it was chosen to focus exclusively on healthcare professionals' knowledge and recommendations, without considering the area which involves their '*beliefs*'. This choice was made because this is still a '*grey area*', and while the influence of knowledge and recommendations has been investigated and will be presented in the following sections, the influence of beliefs is still vastly unexplored. Moreover, it is often quite hard to establish clearly where the border between awareness and beliefs is.

2.2. History of SIDS

The first trace of SIDS existence goes back to antiquity. In the Old Testament of the Bible (The Judgement of Solomon, First Book of Kings, 3:19) it is possible to find the following verse: '*And this woman's child died in the night, because she lay on him*'. Among the Egyptians, mothers who were accused of being responsible for overlaying their babies were not executed like murderers, but were condemned to hug the corpse of their children for three days and three nights, so that they would experience the full deserts of remorse and horror. In Babylonia SIDS was attributed to the demon god Larbatu. Even Latin literature provides examples of SIDS, for example in the sixth book of Virgil's Aeneid (Russell-Jones, 1985). In any case, the response

from communities to cases of SIDS (when not yet recognized as such) was often negative and accusatory: the common assumption was that parents had been negligent and careless in managing the infant, or worse, that they actually abused the child (Savitt, 1979). It is remarkable that SIDS was not a matter in which police and courts showed much interest until the 17th or 18th century. Before, this matter was dealt with by parents and church officials. During medieval times, in fact, overlaying was '*the principal means of infanticide and the major problem for the Church courts*' (Helmholz, 1975). In ecclesiastical legislation, overlaying was associated with infanticide despite the usually recognized accidental nature of the incident. The law assumed that negligence or carelessness had to be involved in overlaying, and that despite parents' lack of intent to kill, a church crime had been committed which required punishment (Helmholz, 1975). Attitudes toward and punishments for infants' suffocation did not change much during the Renaissance, but slowly, a transition from prosecution for infanticide in ecclesiastical courts to secular courts occurred, paralleling the increasing ability of medical personnel to perform autopsies and to determine the causes of death (Savitt, 1979).

However, the theory embracing the explanation that these deaths were the cause of infants' abuse by their parents held until the 19th century. Until then, it was common for parents to share the bed with their children, and this exposed the infants to a high risk of getting overlain (Russell-Jones, 1985). Before the industrial revolution, SIDS continued to pass most of the time unnoticed by the scientific community given the harsh social conditions and the high mortality rates. However, thanks to the progress of medicine of the 19th century and of first half of the 20th, infant mortality begun to decrease in most developed country, so that the scientific community became fully aware of SIDS and begun to draw attention to it. Its rate was found to be almost the same in all developed countries: around 3‰ among healthy born infants, which made of SIDS the first cause of death among healthy born infants (Camarasa Piquer, 2003). Civil and coroner's courts began investigating cases of overlaying and smothering to determine cause of death, making an explicit distinction between child abuse and SIDS (Forbes, 1978; Adelson and Roberts Kinney, 1956). From the early 19th century the most common explanation for SIDS was given by the theory of '*thymic asthma*', expanded in 1889 by the theory of the '*status thymicolymphaticus*' (Paltauf, 1889): the death of the infant, according to this theory, was attributable to asphyxia following a great

increase in the size of the thymus. Since the thymus was sensitive to radiation, radiation therapy became the most common way of treating such kind of disorder, so that some people even advocated prophylactic irradiation for all neonates (Jacobs et al., 1999; Moncrieff, 1937). Despite the German physician Friedleben demonstrated already in 1858 that the thymus could in no way be the cause of SIDS (Friedleben, 1858), this theory was rejected by the scientific community only after it had been proved not to exist as a pathological entity in 1931 (Young and Turnbull, 1931). Nevertheless, its therapy was abandoned only in the 1950s, after it had been proved to increase the risk of thyroid malignancy and other tumours including breast cancer (Camarasa Piquer, 2003; Jacobs et al., 1999).

In the 1950s and the 1960s, then, the infants' deaths that might have been caused by SIDS begun to be recorded and described by autopsy reports, following the principle that the autopsies were the only way to understand which was the real cause of death (Bruner, 1952). The first clear effort to ascribe a natural process to the cause of death was made in the late 1950s and early 1960s. During these years, Parish and Barrett proposed a theory in which the cause of SIDS was thought to be an allergic response to foreign protein in the form of cows' milk (Parish and Barrett, 1960). In 1963, Seattle (United States) held the '*First International Conference on Causes of Sudden Death in Infants*'. In 1965 SIDS was allocated for the first time a code of the International Classification of Diseases (ICD-8 795, which eventually became ICD-10 R95). In 1969 the first commonly accepted definition of SIDS was put forward by Dr J. Bruce Beckwith: '*The sudden death of an infant or young child, which is unexpected by history, and in which a thorough post mortem examination fails to demonstrate an adequate cause of death*'. In 1972 a study by Steinschneider suggested a correlation between prolonged apnoea (which is the cessation of breathing for 20 seconds or longer, or a briefer episode associated with bradycardia, cyanosis, or pallor – Nelson et al., 1978) during sleep and SIDS (Steinschneider, 1972). This hypothesis was internationally accepted and programs stimulating the use of cardio-respiratory home monitors were sponsored by many institutions like the American Academy of Pediatrics (AAP) (Nelson et al., 1978). Unfortunately, in 1982 the results of these programs were discussed in Baltimore, but despite their importance it was clear that the cause SIDS was far from being aetiologically determined (Mitchell, 2009b; Tildon et al., 1983). In 1985, Davies discovered that in Hong

Kong, where the common habit was to put infants to sleep in a supine position, SIDS was very rare (Davies, 1985). On the contrary in the United States, where the SIDS rate was much higher, most infants were placed in their bed prone until 1992 (Task Force on infant positioning and SIDS, 1992), as it was believed that the prone position granted benefits (such as a lower likelihood of aspiration and a lower gastroesophageal reflux) (Task Force on infant positioning and SIDS, 1992; Orenstein and Whittington, 1983). Following Davies's findings, many epidemiological studies run in the 1980s and 1990s showed a lower incidence of SIDS in those infants who slept supine. In 1992, when in most developed countries recommendations regarding the infants' sleep position began to be given to parents, Guntheroth and Spiers pooled the evidence collected by all the epidemiological studies carried out up to that year, and their results confirmed the strong protective effect of the supine position towards the risk of SIDS (Guntheroth and Spiers, 1992). That same year the AAP published recommendations for preventing SIDS, strongly discouraging all those in charge of newborns from putting them to sleep prone (Task Force on infant positioning and SIDS, 1992). In 2005 an updated version of the AAP guidelines recommended exclusively the supine sleeping position (Task Force on SIDS, 2005). As prone sleeping became a less common risk factor, new epidemiological risk factors emerged (Moon et al., 2007a).

Since 1987 prevention campaigns have been run in most developed countries, called Back-to-Sleep (BTS) campaigns, aimed at raising awareness of the supine position's effect in reducing the risk of SIDS (Ponsonby et al., 1998). In most of these countries, the rate of placing infants prone for sleep decreased by 50–90%, and the rate of SIDS similarly decreased by 50–90%. It was calculated that, since 1990, the efforts made for changing the predominant infant sleep position might have saved about 40,000 lives in the USA, 3,000 in New Zealand, and about 17,000 in England and Wales (Mitchell and Blair, 2012).

2.3. A speculative cost-benefit analysis of the effects of prevention campaigns

If we were interested in performing a cost-benefit analysis of the effects that prevention campaigns (which include both informative campaigns for parents and training campaigns for healthcare professionals) had on society,

we could start from the numbers cited at the end of Section 2.2. Before beginning the analysis, though, it should be pointed out that, without more detailed information, such an analysis only represents a theoretical speculation.

Looking at England and Wales, for example, we could begin by extrapolating the average life expectancy for the period spanning from 1990 to 2008 (the last year considered in the calculations by Mitchell and Blair). This index varied from 75.6 years in 1990 to 79.7 in 2008, and had an overall average of 77.6 years in our period of interest (Office for National Statistics, 2011). It is reasonable to suppose that those children who no longer die from SIDS are likely to live to old age, and therefore the person-years of life saved for each baby that does not die are considerable.

In order to describe the overall benefits of the BTS campaigns for the British society (B), then, we should come up with something like:

$$B = x \left(\sum_{i=1}^M y_i * 77.6 + \sum_{j=1}^N z_j * 77.6 + \sum_{k=1}^O w_k * 77.6 \right) - t - u + v \quad (2.1)$$

where:

x represents the economic value of a person-year of life;

y_i (with $i=1,2,\dots,M$) represents the expected number of children's lives that have been saved by the i -th parent because of the BTS message received exclusively by a trained healthcare professional;

z_j (with $j=1,2,\dots,N$) represents the expected number of children's lives that have been saved by the j -th parent because of the BTS message received exclusively through an informative campaign;

w_k (with $k=1,2,\dots,O$) represents the expected number of children's lives that have been saved by the k -th parent because of the BTS message received both by a trained healthcare professional and through an informative campaign;

t represents the cost of the healthcare professionals' training campaigns;

u represents the cost of the informative campaigns;

v represents the overall benefits given by a lower mortality rate to the welfare of the population.

Provided that, according to Mitchell and Blair, the BTS campaigns saved about 17,000 lives in England and Wales, we know that $(\sum_{i=1}^M y_i * 77.6 + \sum_{j=1}^N z_j * 77.6 + \sum_{k=1}^O w_k * 77.6)$ in Equation (2.1) should be about 1,319,200,

which corresponds to the total person-years of life saved by the campaigns (17,000x77.6) (Mitchell and Blair, 2012).

As a consequence, if we attribute a mere 1£ value to each person-day of life saved (which corresponds to 365£ per each person-year of life), this would imply a potential budget of almost half a billion pounds for the BTS campaigns in the period 1980–2008. Speculatively, even if policymakers dedicated to the BTS campaigns an amount of 15 million pounds each year (which is quite considerable considering that it would have run for 28 years in a row), this would still imply benefits for the British society which could be estimated in more than 60 million pounds, plus the overall benefits given by a lower mortality rate to the welfare of the population (so far not accounted for).

As a result, we could affirm that, on any reasonable speculation, the BTS campaigns are an extremely beneficial investment for the society.

2.4. SIDS and its risk factors: the best practice

Over the years many epidemiological studies discovered a number of behaviours which can significantly affect the risk of SIDS, so that it is now possible to implement some simple interventions to reduce it (Task Force on SIDS, 2011a). In this section I introduce the latest evidence in terms of recognized risk factors for SIDS.

The sleeping position is the strongest risk factor for which it is possible to intervene in order to reduce the risk of SIDS. The supine position is the safest position and, compared with the supine, the prone position has 2.3–13.1 times the risk of death from SIDS (Carpenter et al., 2004; Hauck et al., 2003; Li et al., 2003; Blair et al., 1999; Fleming et al., 1996), and the lateral position 2.0 times the risk (both significant at 5%) (Li et al., 2003). According to recent studies, the dangers of the prone and of the lateral position are to be considered very similar, especially if we account for the population-attributable risk (Task Force on SIDS, 2011a).

It is worthy underlining that, despite being the strongest risk factor, there are doubts about whether the sleeping position could be SIDS ultimate determinant, insofar as the cause of this syndrome remains unclear and the guidelines keep changing according to the latest scientific evidence (see Section 2.5, page 23). It is challenging to take this uncertainty into account, however, by considering all the risk factors for SIDS that have been

investigated up to date, it is likely that the ultimate determinant will be strongly correlated to one or more of them (if not to the sleeping position itself). As a result, even though this research has a major focus on the sleep position, the fact that it also analyses healthcare professionals' knowledge of the other risk factors should shield it from major biases.

As mentioned above, other behaviours were also identified as potential risk factors for SIDS. All the interventions to reduce the risk of SIDS are periodically reviewed by the Task Force on SIDS of the AAP, and the most important among those which were suggested in 2011 (Task Force on SIDS, 2011a) are presented here below; however, it is important to remember that each country has its specific recommendations.

(a) Crib mattress. A firm crib mattress which was designed for the specific crib should be used in order not to leave gaps between the mattress and the side of the crib. This should be covered by a fitted sheet. Additionally, infants should not be placed for sleep on adult-sized beds because of the risk of entrapment and suffocation (Blair et al., 2006; Ostfeld et al., 2006; Scheers et al., 2003).

(b) Room-sharing and bed-sharing. While it has been showed that the first precaution decreases the risk of SIDS by as much as 50%, (Tappin et al., 2005; Carpenter et al., 2004; Blair et al., 1999; Mitchell and Thompson, 1995) so far no bed-sharing situation has been identified which is protective against SIDS (Task Force on SIDS, 2011a). Moreover, bed-sharing must be avoided at all times if the infant is younger than 3 months, if either of the parents (or both) smoke or if the mother smoked during pregnancy, if either of the parents (or both) is excessively tired or has taken medications or substances that could impair his or her alertness, and with anyone who is not a parent (including other children). Additionally, co-sleeping should be avoided on soft surfaces (such as sofas, couches, or armchairs) and on surfaces with soft bedding (Vennemann et al., 2012; Fu et al., 2010; Blair et al., 2009; Arnestad et al., 2007; McGarvey et al., 2006; Tappin et al., 2005; Carpenter et al., 2004; Hauck et al., 2003; McGarvey et al., 2003; Blair et al., 1999; Fleming et al., 1996; Scragg et al., 1993).

(c) Soft objects and loose bedding. Both soft objects and loose bedding should be kept out of the crib, while infant sleep clothing can be used provided

that there is no risk of head covering or entrapment (Task Force on SIDS, 2011a).

(d) Smoking. Both maternal smoke during pregnancy and smoke in the infant's environment after birth should be avoided, as they are major risk factors for SIDS (AAP Committee on Environmental Health et al., 2009; Best et al., 2009; Shah et al., 2006; MacDorman et al., 1997; Schoendorf and Kiely, 1992; Willinger et al., 1991; Haglund and Chattingius, 1990; Malloy et al., 1988).

(e) Alcohol and illicit drugs. Both alcohol and illicit drugs consumption should be avoided during pregnancy and, also, periconceptionally. Because the timing of conception cannot be predicted with accuracy, this implies that women intending to get pregnant should avoid alcohol and illicit drugs (Fares et al., 1997; Kandall et al., 1993; Durand et al., 1990; Ward et al., 1990; Rosen and Johnson, 1988; Chavez et al., 1979; Rajegowda et al., 1978).

(f) Breastfeeding. Breastfeeding is recommended, as it is associated with a lower risk of SIDS. If possible, infants should be exclusively breastfed for 6 months, as its protective effect increases with its exclusivity (Hauck et al., 2011; Ip et al., 2009; Vennemann et al., 2009). This is consistent with the AAP and National Health Service (NHS) policy on breastfeeding and the introduction of solid foods (AAP Section on Breastfeeding, 2012; Department of Health, 2011).

(g) Pacifiers. Parents should consider offering infants a pacifier at nap time and bedtime as it was reported to have a protective effect on the incidence of SIDS. The pacifier's protective effect persists even if it falls out of the infant's mouth, so it should not be reinserted once the infant falls asleep (Carpenter et al., 2004; Hauck et al., 2003; McGarvey et al., 2003; Fleming et al., 1999; L'Hoir et al., 1999). In case of breastfed infants, its introduction should be delayed until breastfeeding has been firmly established (Jenik et al., 2009; AAP Section on Breastfeeding, 2005).

(h) Room temperature. Parents should avoid overheating in the room where the infant sleeps. The AAP does not recommend a specific temperature as it seems very hard to determine an optimal temperature for the infants' environment (Task Force on SIDS, 2011a). However, the International Society for the Prevention and Study of Perinatal and Infant Death (ISPID) suggests that,

in order to minimize the risk of SIDS, the room temperature should be kept between 18°C and 22°C (International Society for the Prevention and Study of Perinatal and Infant Death, 2013; Blair et al., 2008; Iyasu et al., 2002; Ponsonby et al., 1993; Ponsonby et al., 1992; Fleming et al., 1990).

2.5. Changes in the recommendations for SIDS prevention

As mentioned in Chapter 1, the uncertainty about the aetiology of SIDS implied a great attention to the epidemiological findings about behaviours that help reducing its risk. However, it is very interesting to point out how the recommendations given by the official authorities about SIDS prevention changed over time following the latest scientific evidence.

The most famous change is the one referring to the sleep position. Nowadays it is commonly known that the supine sleep position is the most important behaviour that parents can adopt to reduce the risk of SIDS. However, when the AAP (one of the most important authorities in this field) released its first recommendations about SIDS in 1992, and then again in 2000, recommended that *'infants should be placed for sleep in a nonprone position'* (Task Force on Infant Sleep Position and SIDS, 2000; Task Force on infant positioning and SIDS, 1992). It was only in 2005 that this recommendation was changed to *'infants should be placed for sleep in a supine position (wholly on the back) for every sleep. Side sleeping is not as safe as supine sleeping and is not advised'* (Task Force on SIDS, 2005).

Another big change regarded the role of breastfeeding. In 1992, in fact, the AAP recognized that *'breastfeeding has been associated with a decreased risk'* (Task Force on infant positioning and SIDS, 1992). In 2000 and 2005, however, it stated that *'although breastfeeding is beneficial and should be promoted for many reasons, the Task Force believes that evidence is insufficient to recommend breastfeeding as a strategy to reduce SIDS'* (Task Force on SIDS, 2005; Task Force on Infant Sleep Position and SIDS, 2000), but in 2011 it went back to recommending it again to parents (Task Force on SIDS, 2011a).

Other changes regarded: the recommendation to avoid smoking during pregnancy; the recommendation that infants should not share the bed with their parents during sleep; and the recommendation to offering a pacifier at nap time and bedtime.

2.6. Healthcare professionals' influence on parents' behaviour

As mentioned in Chapter 1, the recommendations that healthcare professionals give to parents, and what parents see that they are doing during their daily practice, have a great influence in the subsequent parents' behaviour at home. This is especially true in the matter of the sleep position.

In 1998, in fact, Brenner and colleagues discovered that observed hospital sleep position could modify maternal intentions and also the sleep position adopted for the infant. They showed how mothers who observed their infants being placed in the prone position in the hospital were more likely to put them in such a position compared with mothers who observed their infants placed in a non-prone position in the hospital. Also, the likelihood of placing the infants to sleep in the prone position was much higher for those mothers who did not report discussing sleep position with a healthcare professional during the postpartum stay than for those who reported having had such a discussion (Brenner et al., 1998). In a similar vein, Lesko and colleagues reported how, among mothers that used a non-prone sleep position at 1 month, the advice of healthcare professionals was often cited as the most important influence when they were asked about the determinants of the sleep position's choice (Lesko et al., 1998). In 2000, Willinger and colleagues obtained important results about the consequences that the recommendations have on parents' behaviour. They succeeded in demonstrating the direct relationship between the recommendations that parents received and their choice for positioning their infants during sleep. Moreover, they demonstrated how the more the message was repeated to parents from different sources the more the choice of the supine position would have been the most likely. If parents both read and heard about the benefits of the supine position, and these were confirmed and endorsed both from a physician and from a nurse, the likelihood of choosing this position for their infants' sleeping time was more than 5 times higher than that of parents that were not exposed to any of these messages (Willinger et al., 2000).

In 2001, Colson and colleagues investigated the relationship between the choice of sleep position for infants at home and the perceptions of what parents experienced in the postpartum period about infant sleep positioning. The results of the study show how parents are influenced in the choice of the position into which putting their infants to sleep and how this influence can be traced back to their own perception of the advice that they received from

healthcare professionals. In particular, both parents who stated that they received advices about the safest sleep position and those who perceived that their infants were put to sleep supine by the healthcare professionals were more likely to put their infants to sleep in the supine position (Colson et al., 2001).

In 2002, Colson and Joslin confirmed the results of the previous studies. After giving a specific '*back-to-sleep*' training to all the healthcare professionals involved in their project, they measured the effects that this intervention had on parents. After the intervention, healthcare professionals' actions had caused the parents' awareness of risks to increase significantly compared to that of parents interviewed before the training was delivered. As a consequence, parents' behaviours changed, with higher percentages putting their infants to sleep supine and avoiding the prone position (Colson and Joslin, 2002). Again in 2002, Moon and Omron found similar results, estimating in 5.7 the odds ratio of parents putting the infant back to sleep if they had heard a back recommendation from a healthcare professional. It is also important to report that if the parents received a side or side/back recommendation (that is a wrong recommendation) the odds ratio of parents putting the infant back to sleep was estimated in 0.26 (Moon and Omron, 2002).

In 2004 Stastny and colleagues reported a strong interaction between the position that mothers adopted to put their infants to sleep and (1) what they saw nurses doing in their daily routine and (2) the recommendations they were given. They found that 80.2% of the mothers who both observed and received recommendations about exclusive supine sleeping stated that they usually put their infants to sleep on their back. However, this percentage decreased to 60.5% and 55.0%, respectively, if either the direct observation or the recommendations were missing, and dropped to 7.3% if both of them were missing (Stastny et al., 2004).

2.7. Conclusions

Because of the uncertainty about SIDS causes, the context of SIDS prevention is subject to changes in the best practice due to new evidence that is periodically discovered. Newborns' parents are the only persons that can actively implement all the interventions to try to prevent SIDS, and healthcare

professionals are the most important figures in charge of transmitting the SIDS prevention message to them. The recommendations and example given by healthcare professionals have a strong influence on what parents do, and this is the reason why healthcare professionals need to possess the most up-to-date knowledge about SIDS and its risk factors.

If this condition is achieved, parents will receive the current SIDS prevention message and, as a consequence, will likely expose their children to the lowest possible risk of SIDS. If this is not the case, instead, they may expose their children to highly risky situations. Policymakers should struggle to eliminate such an eventuality by providing healthcare professionals with the best knowledge and by periodically assessing it in order to check if it complies with the actual best practice.

3. The SIDS Project and its surveys

The SIDS Project (which is the name that has been used to market the surveys among the target populations) is meant to provide the first data about healthcare professionals' knowledge and behaviour about SIDS and its risk factors in the United Kingdom and Spain. Data about Italy were already available when the research began, and this allows a cross country comparison involving three different realities.

3.1. The SIDS Project

The SIDS Project consists of two mail surveys implemented in the UK and Spain. Considering the dimension of the task and the lack of existing information on this topic, it was chosen to implement the surveys only in one region per country. The selected regions were NHS South Central Strategic Health Authority for the United Kingdom (which includes Berkshire, Buckinghamshire, Hampshire, Isle of Wight and Oxfordshire) and Cataluña for Spain (later on the province of Gerona was dropped because of lack of interest of the local policymakers). The data available for Italy belonged to eleven different regions, but, in order to improve cross country comparability, it was chosen to use only the data that refers to Veneto. The reason why these regions were chosen lies in the fact that all of them represent wealthy areas in these countries, and they are supposed to have good and up-to-date healthcare systems. Moreover, in all these three countries healthcare policies and decisions are not ruled by the central government, but they are delegated to the single regions. All these conditions should avoid, or at least reduce, biases due to the underlying richness and structure of the territory.

The target population for the British survey consisted of general practitioners (GPs), who are generalist physicians and usually represent the first contact between an individual and the National Health Service (NHS). Originally, it was considered that midwives and health visitors could have been included in the target population as well as they are the classes of healthcare professionals who are mainly responsible for delivering parents the messages about SIDS. However, for several reasons they were not chosen as final target

population. First, after some informal talks with newborns' parents, it emerged that their confidence towards midwives and health visitors was not always very high, and that they often referred to their GP for advice and recommendations. Second, populations of midwives and health visitors are very different from the population of GPs and including them would have implied much more time and funding than was available. Third, it was not possible to obtain an up-to-date sample frame for the populations of midwives and health visitors. Attempts were made to contact the Royal College of Midwives but these were unsuccessful. As a consequence, the possibility to include them was left to an eventual future research project.

The target population for the Spanish survey, instead, consisted of paediatricians, who are physicians specialized in child health and are among the subjects in charge of delivering parents the messages about SIDS. In order to focus only on those paediatricians who were still practicing it was chosen to exclude from the sample frame all those that were older than 70 years old.

The data available for Italy included many different healthcare professionals (physicians, nurses, healthcare assistants, etc.), but, considering also the structure of the British and Spanish survey, it was chosen to focus only on paediatricians when making cross country comparisons. The British target population will thus be different from that in Spain and Italy, as GPs are generalists, not specialists, in child health. Such a difference may translate into a lower overall knowledge about SIDS and its risk factors among the British respondents, but, once that all the results are properly contextualised, this will not constitute a problem for the results of the SIDS Project.

3.2. The healthcare systems in the participating regions

Before describing in details the SIDS Project, the structure of the healthcare systems in the three considered countries will be presented. As mentioned before, these systems present some significant differences between them, so it is important to understand which these differences are and why they should be carefully taken into consideration when preparing the surveys, analysing the data and drawing any conclusion from them. These aspects acquire even more importance if we consider that, because of the structure of these countries' healthcare systems, any intervention following the results of this study will likely be country-, or even region-, specific.

Figure 3.1, 3.2 and 3.3 show how the healthcare systems are structured in terms of prenatal, labour, and postnatal care. As it can be seen, in all the three countries there are specialized professionals that do not normally interact with newborns' parents in case of a normal development of the pregnancy. If any concern arises, though, these figures become involved in order to follow the pregnancy's development.

Figure 3.1. Prenatal, labour, and postnatal organization of the healthcare system in the United Kingdom.

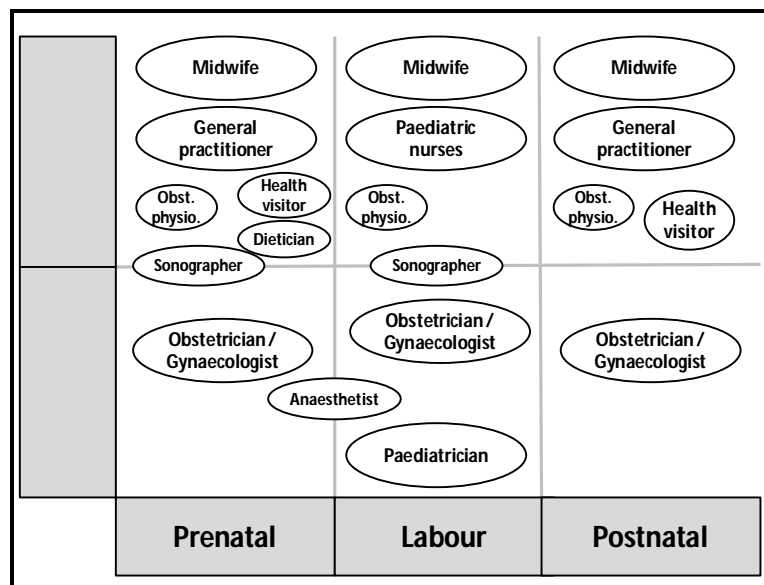


Figure 3.2. Prenatal, labour, and postnatal organization of the healthcare system in Spain.

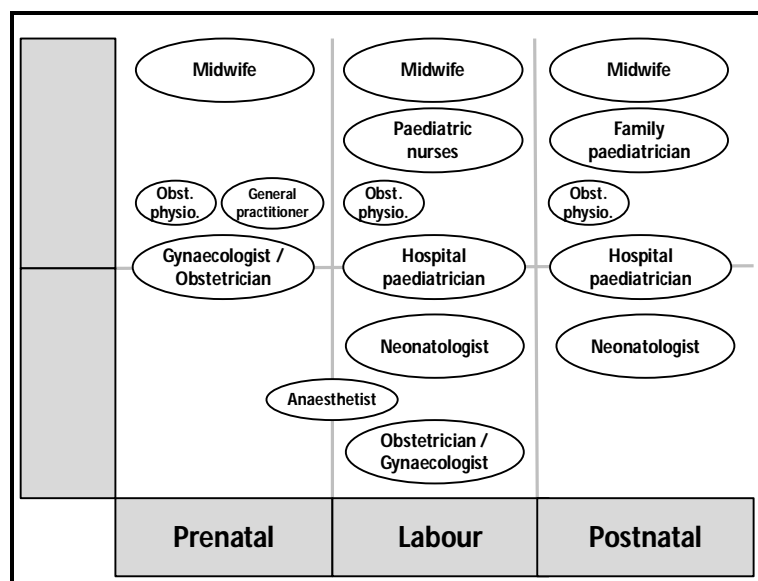
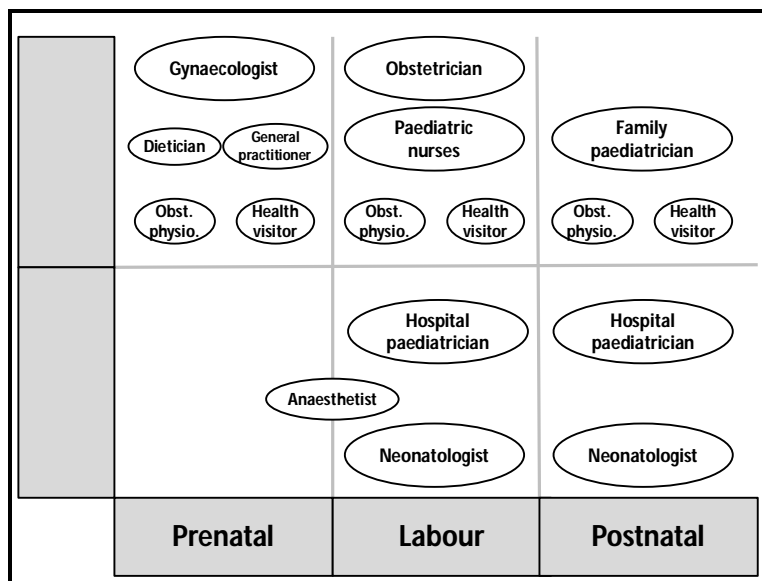


Figure 3.3. Prenatal, labour, and postnatal organization of the healthcare system in Italy.



As it emerges from Figure 3.1, 3.2 and 3.3, the most important differences between these healthcare systems are about the following professional figures: midwife, general practitioner (GP), obstetrician- gynaecologist and family paediatrician.

In the United Kingdom the midwife and the GP represent the most important figures of the interaction between healthcare system and newborns' parents. They are both involved during all the phases of the pregnancy, and they represent the figures to which newborns' parents will naturally ask any question they may have about the health of their infants. The health visitor is also an important figure, but it does not tend to have as many contacts with newborns' parents as midwives and GPs do. An aspect that tends to peculiarly identify the British healthcare system is that women whose pregnancy follows a normal development will probably never meet paediatricians or obstetrician- gynaecologists.

In Spain, instead, the most important figures for newborns' parents are the midwife ('*matrona*') and the family paediatrician (each child is assigned one). This last figure, completely absent in the British healthcare system, is a highly skilled professional who is specialised about infants and children, and to whom parents can address all the questions they may have about the health of their infants. In case of concerns, the Spanish system relies on the intervention of hospital paediatricians, neonatologists and obstetrician- gynaecologists.

The Italian healthcare system, finally, does not involve the figure of the midwife at all. Instead, newborns' parents tend to be followed by specialised physicians (gynaecologists and obstetricians) from the beginning of the pregnancy. Much like in the Spanish system, the GP may play a role in the prenatal period, but in the postnatal one all the responsibilities tend to be delegated to the family paediatrician. Also, in case of concerns parents will be put into the hands of hospital paediatricians and neonatologists.

In this study primary attention will be given to those healthcare professionals who account for the highest number of interactions with newborns' parents. Due to the differences shown in Figure 3.1, 3.2 and 3.3, and as explained in the previous section, the target populations in the three countries will not consist of the same healthcare professionals. However, it should be kept in mind that the interactions with parents of the more specialised professionals are probably more important (on average) than those of the less specialised professionals, even if in term of numbers they are far less than the first ones. In the former case, in fact, these interactions are likely to involve pregnancies and/or infants who had some complications or concerns, and who might then be at a higher risk of SIDS than healthy infants.

3.3. How to assess healthcare professionals' knowledge

As mentioned in Chapter 1, '*knowledge*' can be defined as a latent trait, and, due to its peculiar nature, the only way to measure it is to use the information given by a series of different items that are determined by it.

Since one of the objectives of the SIDS Project is to assess healthcare professionals' knowledge about SIDS and its risk factors, it was chosen to use the most common tools to tackle the issue of latent traits: the models belonging to the Item Response Theory (IRT) (Baker and Kim, 2004; Hambleton and Swaminthan, 1985). The aim of these models, in fact, is to measure objectively these concepts and to determine how much of them a person possesses. The IRT was developed in the second half of the twentieth century and began to be investigated in 1943, when Lawley published a paper showing how it was possible to express in terms of parameters of the item characteristic curve (ICC²) many of the test-level constructs of classical test theory (Lawley, 1943). After Lawley's work, the theory was defined and explored by Lord (who also began to develop software to put the theory into

practice) (Lord, 1980; Lord and Novick, 1968; Lord, 1952), and then expanded by Rasch, Wright, Hambleton and Swaminthan (Hambleton and Swaminthan, 1985; Wright and Masters, 1982; Wright, 1977; Rasch, 1960).

IRT consists of a family of parametric models which aims at measuring, in a quantitative scale, variables that were measured in a nonlinear scale through a series of items. If we consider 100 items, in fact, and a final 1-100 score, the distance between 52 and 56 and the one between 96 and 100 are equivalent from an arithmetical point of view. However, it would be hard to sustain that they have the same conceptual meaning. To account for this distortion that occurs when describing respondents with extreme, but different, scores of the latent variable, we can use a context which is probabilistic rather than deterministic (Wright and Masters, 1982). This means that a score of '1' which was attributed to an item 'X' is transformed into the expected probability of observing a score of '1' for the item 'X', thus transforming it into a value which will be included in the continuous interval $[0,1]$ (Bacci, 2006). By a logit transformation we then allow focusing the attention on a value which will lay in the whole real axis, and whose scale will be consistent both arithmetically and conceptually (Robusto and Anselmi, 2012).

One of the models used in this PhD project is the Rasch model, which plays a key role within the IRT. As it was theorized by Rasch in 1960, the model considers a dependent dichotomous variable, an ability parameter to be assigned to each respondent and a difficulty parameter to be assigned to each item. This is now known as the '*simple form*' of the Rasch model, as it has been expanded as the IRT family was further investigated. This development was necessary in order to make the model more versatile and adaptable according to the nature of the dependent variable that was being analysed. A more detailed description of the Rasch model can be found in Section 6.3.1 (page 78).

Provided that, in order to be able to assess healthcare professionals' knowledge, it is necessary to obtain from them information about the items that are determined by the latent construct (in this case items that identify different risk factors for SIDS), the only way to obtain from them such information was through a survey.

3.4. The choice of the survey mode

Clearly, the choice of the mode is one of the most important phases of a survey. Thus, it is important to carefully consider all the advantages and the disadvantages of the different modes and to do this in light of the needs of the specific survey. Nowadays, the choice of possible modes includes face-to-face surveys, internet surveys, mail surveys, and telephone surveys.

Over time, the advantages and disadvantages of each mode have changed together with the development of new technologies and their interaction with the main characteristics of a survey: human interaction, trust, the time involvement of each respondent, the attention given to each respondent, and respondents' control (over access and response) (Dillman et al., 2009). The great changes that have also occurred in the society and in social interaction have had a major impact on all these aspects.

Table 3.1 goes through all the changes in the way of conducting a survey that occurred over the last fifty years. Prior to the 1960s, for example, sample members were commonly approached for a face-to-face interview by a woman who was dressed appropriately. In the early 1970s, though, telephone and mail surveys began to become more and more popular, while by the early 1980s the mail survey was the dominant mode for governmental surveys. In the 1990s and 2000s, then, the changes were much quicker, and web surveys became the most common mode. In the last years multiple modes surveys also became more popular, but they require that questions must be written in a way that assures the same measurement across modes. Due to this need, surveyors choosing this way of implementing a survey have to be competent in all the modes they choose to include in the survey (Dillman et al., 2009).

Nowadays, each type of survey faces its challenges: the face-to-face survey faces the loss of access to secured apartment buildings and communities; the telephone survey faces the loss of representativeness because of the spreading of cellular phones, disconnection of landlines and likelihood of refusal; the web survey faces problems due to the lack of access and skills of some members of the target population and the absence of a population list; the mail survey faces the removal of people's addresses from telephone books. However, this last mode showed only a moderate decline in the response rate, which was proved to be reducible through some particular interventions (Dillman and Pearsons, 2006; Connelly et al., 2003; Dillman and Carley-Baxter, 2001).

Table 3.1. Fifty years of change in respondent involvement and control over the survey process

	1960s	1970s - 1980s	1990s - 2010s
Human interaction	<u>High</u> : in-person visits to respondent homes	<u>Medium</u> : through a telephone	<u>Low</u> : more likely to be with a machine
Trust that the survey is legitimate	<u>High</u> : encouraged by interviewer presence, look, and sincerity	<u>Medium</u> : encouraged by voice inflection	<u>Low</u> : because of possibility that survey is fake
Time involvement	<u>High</u> : interviewer goes to each respondent	<u>Medium</u> : one-on-one but contact effort is minimal	<u>Low</u> : up to no time with individual respondents
Attention given to each respondent	<u>High</u> : because of time to find and interview each respondent	<u>Medium</u> : because of placing calls one after another	<u>Low</u> : mass emails
Respondent control over access	<u>Low</u> : households generally accessible	<u>Medium</u> : unlisted numbers, voice mail, and call monitoring	<u>High</u> : caller ID, call blocking, email filters
Respondent control over whether to respond	<u>Low</u> : required breaking off human interaction	<u>Medium</u> : ease of hanging up telephone	<u>High</u> : social support for refusing

Source: Dillman, Smyth, and Christian (2009, page 2).

In the case of the SIDS Project the mail survey was chosen as the survey mode both for the British survey and for the Spanish one. This choice was taken after considering advantages and disadvantages of three of the four main survey modes (Table 3.2): the face-to-face mode was excluded from the beginning because of budget constraints. All the considerations reported in Table 3.2 were made in relation to this particular project and after taking into account how different aspects of the survey design could imply different amounts of leverage on the participants' decisions to reply (Groves et al., 2000).

Given the importance of gathering a sample frame of good quality, the web survey was excluded. The reason behind this choice is that email addresses

were not available for most of the British sample members and for 30% of the Spanish ones. Then the telephone survey was also excluded because of the possible biases due to the action of gate keepers (e.g. the managers of the surgeries) and in order to allow respondents to complete the survey at their own pace, answering the questions without time pressure.

In the event, the Spanish survey was subsequently changed into a multiple modes survey for increasing its response rate. However, in order not to lose comparability across surveys, it was chosen to initially run a mail survey just like it had been done in the United Kingdom, and then, after the last postal reminder, to include an electronic reminder for those sample members whose email address was available (Appendix 9: Email reminder - Spain, page 167; Appendix 10: Email questionnaire - Spain, page 169).

Table 3.2. Evaluation of the advantages and disadvantages of the different survey modes

	Telephone survey	Web survey	Mail survey
Contact list	<u>Medium difficulty</u> : to talk with a physician you often need the help of the manager. More-over some physicians work only few days a week in a practice	<u>High difficulty</u> : hard to get an exhaustive list and it is not guaranteed that all physicians have an email address [and that they use it])	<u>Low difficulty</u> : the list of physicians' surgeries was public in England and available to the partner institutions in Spain
Filling in time	Established with the interviewer (more restrictive)	At the respondent's convenience	At the respondent's convenience
Biases	Interviewer Auto-selection	Technology friendliness Auto-selection	Auto-selection
Usual response rate	Medium	Low	Low
Cost	Medium	Low	High
Control over the data collection	Low	High	High

Source: The SIDS Project.

3.5. Designing the survey

The method used for designing the surveys is the Tailored Design Method (TDM), proposed by Dillman in 2000. The TDM implies an approach where solutions are '*tailored to most effectively and efficiently deal with the contingencies of different populations and survey situations*' and it '*involves using multiple motivational features in compatible and mutually supportive ways to encourage high quantity and quality of response to the surveyor's request*' (Dillman et al., 2009). To do so, the TDM shifts the respondent's experience from a general economic exchange perspective (when a monetary price is set in order that all sample members will find it worthwhile to respond) to a social exchange one (when the respondents believe that the rewards that they get from responding will outweigh the costs that they will endure in responding) (Dillman, 1978). The social exchange theory tries to maximize the likelihood of response for all sample members, taking into consideration that people's actions tend to be motivated by the return they are expecting to get from these actions (Blau, 1964). Another interesting characteristic of this method is that it focuses on the reduction of the four sources of survey errors that were identified by Groves in 1989: coverage error, sampling error, nonresponse error, and measurement error (Groves, 1989). Coverage error may occur when the list that is used from drawing the sample does not include all the members of the population: this phenomenon leads to the breaking of the assumption that all members should have a known and non-zero probability of being included in the sample. Sampling error is a natural consequence of surveying only a sample of the target population rather than the whole population: this phenomenon directly influences the precision of the estimates that can be made for the population. Nonresponse error may occur if people that do not respond to the survey are different from those who do respond according to some characteristics that are important to the study: this phenomenon leads to biased estimates for the population. Measurement error may occur when the question wording is inaccurate or poor, such that the respondents' answers are imprecise: this phenomenon leads to a badly constructed survey instrument. A questionnaire which is badly constructed ultimately leads to population's estimates which can be wrong (when respondents answer a question which is different from the one intended by the survey) or highly unstable (when, because of poorly worded questions, respondents answer the right question, but provide imprecise answers).

Following the principles of the social exchange theory, there are three basic areas in which actions taken by the surveyors may help in maximizing the likelihood of response: increasing the benefits of participation, decreasing the costs of participation, and establishing trust between the surveyors and the respondents (Dillman et al., 2009). There are normal practices associated with these three aims, which include providing the participants with information about the survey and its benefits, drawing a short and easy to complete questionnaire that is also highly salient and interesting to participants through the use of engaging questions, a nice visual layout and a simple and easy to understand language, making the response as easy as possible by including a pre-addressed and pre-stamped return envelope, highlighting the importance of each contact by personalizing the correspondence (Christian et al., 2007; Christian and Dillman, 2004). Social exchange theory also suggests that the request made to participants should somehow vary throughout the contacts. Within these changes, however, the message should never lose its clarity, and the wording, especially in the later contacts, and should avoid being negative, demanding or patronizing (Dillman et al., 2009).

In order to minimize the nonresponse rate, it was decided to use three different mailings in each of the surveys. The first mailing consisted of an envelope containing an invitation letter (Appendix 1: Cover letter - UK, page 149), a copy of the questionnaire (Appendix 2: Questionnaire - UK, page 151), and a pre-addressed and pre-stamped return envelope. The second mailing consisted of a postcard (Appendix 3: Postcard reminder - UK, page 153), which worked both as a thank-you and as a reminder. The third mailing consisted of an envelope containing a different invitation letter (Appendix 4: Follow-up letter - UK, page 155) with a more friendly and professional language, another copy of the questionnaire and another pre-addressed and pre-stamped return envelope. As mentioned above, in the Spanish survey an additional electronic reminder and an electronic version of the questionnaire were sent after the third mailing (Appendix 9: Email reminder - Spain, page 167; Appendix 10: Email questionnaire - Spain, page 169). The logo of the institutions involved and the name of the project were present in all mailings, both on the envelopes and on the letters, creating a coherent link among the different contacts and showing legitimization by an authoritative source (Groves et al., 1992; Cialdini, 1984). Based on previous experience reported in the literature,

the effect of each reminder was estimated to be an increase of +10 percentage points in the response rate (Dillman et al., 2009).

3.6. Designing the questionnaire

Designing the questionnaire becomes the next important phase of the research. It is crucial to pay attention and careful consideration to this phase because, once the first mailing is sent out, no further changes will be possible, and if any error is found it may have to be carried over in all the subsequent mailings as well.

The most important aspects of the questionnaire are its content and its visual presentation. The first one represents the tool that will allow the researcher to collect the information on interest, while the second one presents the work done by the researchers to respondents and guides them through the questions.

3.6.1. The questionnaire's content

The questionnaire's content heavily relied on the experience of the Italian campaign GenitoriPiù (see Chapter 5) (de Luca and Boccuzzo, 2013; Boccuzzo and de Luca, 2012). As mentioned before, this was a national campaign which was carried out in Italy from 2007 to 2009 and promoted simple actions proven effective for the prevention of major childhood risks. The prevention of SIDS was one of these interventions. One of the target populations of the campaign consisted of all healthcare professionals involved in all the phases of the pregnancy. Before the beginning of a training campaign, a survey concerning healthcare professionals' attitudes and knowledge was carried out. The part of the survey's questionnaire which was about SIDS investigated healthcare professionals' knowledge about seven SIDS risk factors and their recommendations to parents in terms of sleep position.

In the questionnaire that was adopted for the British survey of the SIDS Project, question 13 aims to replicate the questions that were asked to Italian healthcare professionals (see Appendix 2: Questionnaire - UK, page 151 and Appendix 11: Questionnaire - Italy (pages of interest), page 177). The idea of submitting a list of risk factors to the respondents was maintained, although some of these had to be reversed in order to avoid acquiescence bias (this particular bias derives from respondents' tendency to agree with all the

questions or to indicate a positive connotation for all the items that are proposed to them – Watson, 1992). Also, the response options were slightly modified in order to have a better understanding of the knowledge possessed by the respondents. In the final version of the questionnaire the response options were '*it increases the risk of SIDS*', '*it lowers the risk of SIDS*', '*it does not affect the risk of SIDS*', and '*I do not know*', while in the Italian survey the response options were '*it protects*', '*it does not protect*', and '*I do not know*'. This choice was made because it allowed us to distinguish between healthcare professionals that believed a behaviour to be harmful and those who believed that it did not have any implications for the infant's health.

In order to minimize the burden for the respondents, most of the questions of the survey were proposed in a closed-ended format and the rest of them were hybrids between open- and closed-ended formats (because of the presence of an '*other*' response). The '*other*' response was included in some response sets when it might have happened that respondents could not identify themselves in any of the proposed options. However, these options were carefully evaluated in order not to miss any possible common response, as it has been shown that respondents tend to be more likely to select the options provided than to write their own other responses (Dillman et al., 2009).

The final version of the Spanish questionnaire (Appendix 6: Questionnaire - Spain, page 159) is slightly different from the British one because the Spanish sample frame provided more information and contained more details about sample members. Moreover, some additional questions (such as the one referring to the workplace) were needed in order to get a better understanding of the Spanish circumstances, while others that were useful for describing the British reality did not apply to the Spanish one. In most of the cases, the differences between the British and the Spanish questionnaires always referred to the inclusion of potential explanatory variables, not to that of outcomes of interest. However, there were two exceptions: in the Spanish survey, for example, the correspondent translation of the word '*lowest*' in question 12 was underlined. This change was made because it was noticed that, somehow, a small group of the British respondents read '*highest*' instead of '*lowest*' (this was clearly what happened after a check for consistency in their answers). The other exception is in the item '*placing infants for sleep in a side position*' in question 13, which was modified in '*placing infants for sleep in a prone position*'. This was done because the British version of the question

represented a potential confounder for respondents as it did not contain a reference position. The side position, in fact, increases the risk of SIDS with respect to the supine position, but decreases it (or, according to recent studies, does not modify it – see Section 2.4, page 20) with respect to the prone position.

The technicality of the wording was mainly inspired by the AAP guidelines of 2011 (Task Force on SIDS, 2011a). Efforts were made to keep it simple, short and familiar to respondents, but also formalized and professional, in order to minimize the amount of interpreting and defining that respondents had to do (Dillman et al., 2009).

The final version of the questionnaire was checked and tested with the help of Professor Paul Roderick (Head of the Academic Unit of Primary Care and Population Sciences at the Faculty of Medicine of the University of Southampton), Dr Saul Faust (Senior lecturer in Paediatric Infectious Disease at the Faculty of Medicine of the University of Southampton), Dr James Brown (Reader in Survey Statistics at the Southampton Statistical Sciences Research Institute) and Dr Claire Bailey (Lecturer in Demography at the Division of Social Statistics of the University of Southampton).

3.6.2. The questionnaire's visual presentation

When talking about the questionnaire's visual presentation it is important to pay attention both to the visual presentation of the questionnaire on the whole and to the visual presentation of the single questions. The latter is not less important than the former, because, when respondents are presented with questions that require them to do mental work to formulate their answers, they often look to the questions and their accompanying response options for clues (Dillman et al., 2009). Moreover, it is known that if a question refers to opinions or attitudes, respondents can be substantially influenced by the context as they comprehend the question, recall the relevant information, form a judgement, and report their answer (Tourangeau, 1992). Given the importance of the questions' layout and graphic, many precautions were taken in order to properly guide respondents through the questionnaire without influencing their answers.

The overall presentation of the questionnaire is particularly important for self-administered questionnaires, as it can help guide respondents much like an interviewer might be able to do in a face-to-face or telephone survey

(Dillman et al., 2009). All those visual design elements that communicate meaning to respondents (words, numbers, symbols, and graphics) need to be carefully considered together with their properties (size, brightness, colour, location, shape, etc.). The first step that respondents make when presented a questionnaire, in fact, is distinguishing the visual elements on the page, and this first impression heavily depends on the abovementioned properties (Ware, 2004). It is only after this initial phase that respondents finally focus on the questions.

When designing the visual look of the questionnaire, the following conventions were adopted. A darker and larger print was used for the questions, while a lighter and smaller one was used for the answer choices (in order to separate the question stem and the response options). Response options were separated from the questions through spacing (in order to create the impression that the response options were all part of a group). The space between the response options was maintained constant and consistent all along the questionnaire (in order not to emphasize any particular category and, by doing so, not to accidentally mislead respondents) (Christian et al., 2009). The space dedicated to each single response option was never more than a single line because it seems that extra space associated to an option tends to drive more respondents to it (Dillman et al., 2009). The response '*other*' was positioned as the last choice and it was slightly separated from all the other options (in order to encourage respondents, without forcing them, to choose one of the given ones). Underlining and boldface were used to emphasize important elements (e.g. filters). Visual properties were used with consistency and regularity within the questionnaire. Any additional instruction was positioned right below the questions' stem (in order to ease the respondents' task) but in italic (in order to separate it from the main questions' stem) (Christian and Dillman, 2004). Instructions that were to be read only by some respondents were given a different visual presentation (e.g. arrows and italic for the filters). The font that was chosen was both readable and professional. A line length of about 7 centimetres was adopted in order to avoid inconveniences due to an excessively long or short length.

The design and wording of individual questions varied depending on the kind of questions that were being considered, so that it will be useful to present them according to the questions' nature.

Because the answers provided to open-ended questions are strongly influenced by the visual design of the answer boxes that accompany the questions (Dillman et al., 2009), a great deal of attention was dedicated to this particular aspect. In order to discourage respondents from entering invalid responses, the unit desired in the answers for numerical responses (e.g. years) was provided in the question's stem, was recalled in the background of each box and was provided next to the answer boxes. The answer boxes and the answer spaces were also sized appropriately for the response task in order to prevent respondents from entering extra information (Christian et al., 2007).

In the case of closed questions, response options were carefully considered in order to include all possible answers and to insure that response options were mutually exclusive. Closed questions asking for personal opinions or self-evaluations were formulated in order to present respondents with categories that would be less prone to acquiescence. Questions presenting response options on a nominal scale had these ordered alphabetically (in order not to influence respondents through a particular choice in their ordering). Ordinal scale response options were provided in a symmetrical and balanced format, and all the response categories were presented equally spaced between them (so that they could be treated as interval-level variables in data analysis – Krosnick and Fabrigar, 1997). The big table in question 13 was divided in two parts (one in each side of the questionnaire) in order to limit both its burden and its visual impact; however, the most interesting items were included in the first part (in order to collect at least these answers in case of respondents' drop out of the second part). The shape of the answer boxes was maintained all along the questionnaire in order to create consistency in the symbols for respondents. Response options referring to time were formulated in order to minimize the possibility of them being misinterpreted (options such as '*rarely*' or '*occasionally*' were avoided) (Saris and Krosnick, 2000). The most positive, or highest, response categories were always placed first in the list in order to comply with respondents' expectations (Tourangeau et al., 2004) and to speed up their task (Christian et al., 2009). Efforts were made not to break down the response options into different columns in order to avoid biases depending on the way respondents process the response categories (horizontally or vertically) (Christian and Dillman, 2004).

3.7. Implementing the surveys

Given the structure and size of the project, some months were spent to secure enough funding to implement the two surveys and to disseminate their results. To implement the Spanish survey, moreover, a trip was made in November 2011 to set up an agreement of collaboration with the Universitat de Barcelona and the Col·legi Oficial de Metges de Barcelona (COMB). At the end of the fundraising process, the SIDS Project was granted awards by the Southampton University Strategic Research Development Fund (£4,000), the Santander Internationalization Fund (£1,200 in 2011 and £500 in 2010), the Division of Social Statistics (£961), the Parkes Foundation (£600), and the Faculty of Social and Human Sciences (£300). Moreover, the COMB also decided to support the project with a contribution of about £1,800.

Some months were also spent for getting the appropriate ethical clearance from all the involved institutions. By May 2012, the SIDS project had been approved by the Ethics Committee and the Research Governance Office of the University of Southampton (Project ID: 1197), and the Ethics Committees of the NHS trusts of Hampshire and of Portsmouth and Isle of Wight. After discussing with the director of the Àrea de Praxis of the COMB, it emerged that the Spanish part of the project was exempt from any ethical approval, as the COMB already granted from its members the permission to run similar projects.

The survey referring to the United Kingdom was run between May and July 2012, while the Spanish one began in November 2012 and finished by late March 2013. In both cases the design of the surveys was cross-sectional. Two weeks passed between each of the mailings. *Tokens of appreciation* were not used to increase the response rate. The logistics did not change across surveys with the exception of the third electronic reminder that was sent in the Spanish survey to those sample members whose email address was included in the sample frame.

3.7.1. The British survey

The sample frame used for the British survey was retrieved through the website of the NHS, so that the reputation of the frame keeper was not questionable (unlike the case of some non-governmental web agencies). However, the list had been updated for the last time in November 2010, which is about 17 months before the survey was started. This could have been the

source of some bias, especially in terms of retired physicians and newly employed ones, and, as a consequence, this may constitute a topic for future analysis.

To determine the desired sample size we used the standard formula for sample size calculation when the outcome of interest is represented by a dichotomous variable:

$$n = \frac{Z_{\beta}^2 r(1-r)}{\{(N-1)\alpha^2 + r(1-r)\}} \quad (3.1)$$

where:

α represents the level of precision (from 0 to 1);

β represents the confidence level (from 0 to 1);

Z_{β} represents the value of a standard normal distribution that delimits an area of $(1-\beta/2)$ in the right tail of the distribution;

r represents the proportion of the less frequent answer (with a dichotomous variable this means it will range from 0 to 0.5);

N represents the size of the target population.

With a level of precision of 5% ($\alpha=0.05$), a confidence level of 95% ($\beta=0.95$), and a percentage of the less frequent answer of 50% ($r=0.5$), the required sample size for a target population of 2,658 general practitioners was of 336. The dichotomous variables of interest (correct/non correct) consisted of all the items that described healthcare professionals' knowledge and recommendations about SIDS and its risk factors. The choice of $r=0.5$ was made because we are considering several dichotomous variables, and for some of these r might have been of 0.5.

Moreover, as it was extremely unlikely to get a 100% response rate, it was also necessary to estimate the expected response rate (Table 3.3). To do so, 28 surveys previously carried out on this topic were considered. Using the information given by all of them, the resulting expected response rate would have been 64.3%. However, as the SIDS Project's surveys were bigger than most of them, it was preferred to focus on the response rate resulting from those with a sample size of at least 500, and this gave an expected response rate of 37.8%. This still appeared to be too high, given that, even after adjusting for the effects of the reminders (a +10 percentage points effect on the final response rate for each reminder included in the surveys - Dillman et al., 2009), it still implied an initial response rate of 32.8%. As a result, it was chosen to focus only on those surveys with a sample size of at least 1,000 participants.

The (adjusted) expected response rate was 20.7%, which was rounded to 21%. As a consequence, with an initial response rate of 21% and a +10 percentage points effect which would have been given by each of the two reminders, the overall sample size for the survey was of 820. This quantity eventually became 823 after stratifying (with proportional allocation of stratum sample size) for gender and average size of the practice where the GP works.

Table 3.3. Estimation of the expected response rate

	All previous surveys (unadjusted)	Surveys with samples > 500 (unadj.)	Surveys with samples > 500 (adj.)	Surveys with samples > 1,000 (unadj.)	Surveys with samples > 1,000 (adj.)
Number of surveys	28	9	9	5	5
Average sample size	522	1,265	1,265	1,713	1,713
Median response rate	68.6%	37.0%	32.0%	31.6%	21.6%
Average response rate	64.3%	37.8%	32.8%	27.7%	20.7%

Note: the surveys used for these calculations belong to the studies referenced in Section 4.3 (page 54) and listed in Table 4.1 (page 55). Some of the studies can describe more than one survey.

The coding process of the responses progressed in parallel with their collection. To avoid mistakes in this phase, each response was coded once and then checked separately.

The overall response rate for the British survey was 42.4% (Table 3.4).

Table 3.4. British survey's results in terms of responses

	Date of mailing	Working days	Envelopes sent	Received (valid)	Overall response rate	Estimated response rate
First mailing	28/05/12	9	823	222	27.0%	21.0%
First reminder	12/06/12	9	601	36	4.4%	10.0%
Second reminder	25/06/12	89	566	91	11.1%	10.0%
Total	11/09/12	107	823	349	42.4%	41.0%

Source: The SIDS Project, British survey.

However, this rate needs to be adjusted to take into account the sample members who did not reply for specific reasons. Of the 823 original members of the sample, in fact, the following should be removed for the reasons mentioned below:

- 14 sample members for change of address (mailings returned to sender);
- 12 sample members for change of address (proven upon browsing the website of the surgeries where they should have been working);
- 2 sample members for retirement (returned to sender);
- 1 sample member for being on maternity leave (returned to sender).

As a consequence, instead of calculating the response rate with a denominator of 823, this should be done with a denominator of 794, which implies an adjusted overall response rate of 44.0%.

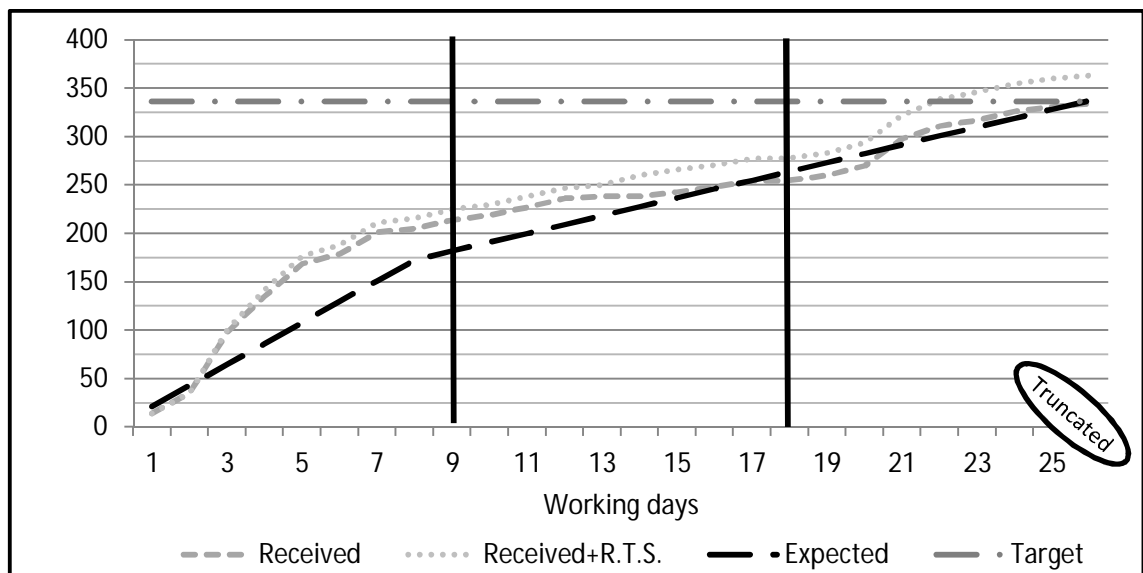
At this point, it would be reasonable to think that also the size of the overall target population should also be modified for this same reason: in fact, it could be argued that the same percentage of participants '*to be removed*' which was found in the sample, 3.6%, would be found in the overall population as well. An interesting result of reducing the overall population of 2,658 GPs by 3.6% would be that the precision of the estimates allowed by the sample size would increase. However, even if it is probably true that 3.6% of the names in the sample frame should not have been in the list, it is also likely that another 3.6% or so of names were not included in the list even if they should have been there. This would be the case of GPs who just begun their career, who just moved in the NHS South Central Strategic Health Authority or who have been called to temporarily replace absent colleagues. These discrepancies are the source of what is commonly called '*coverage error*', with the first case representing a source of overcoverage and the second case representing a source of undercoverage. However, the overall number of GPs in a territory is proportional to the population living in the same territory, thus it is reasonable to assume that for each GP who leaves the practice another one is called to replace him/her. For this reason it was assumed that the real percentages of overcoverage and undercoverage are similar, and thus cancel each other out minimizing the net coverage error. As a consequence, the size of the overall target population and the precision of the estimates have not been changed.

Figure 3.4, shows the results of the survey in terms of responses received day by day. The two reminders were sent on working days 9 and 18.

In Figure 3.4 and Table 3.4 it is possible to see how we possibly underestimated the effect of the first mailing, which exceeded by 6 percentage points our expectations. The two reminders, instead, had a very different effect

on the response rate, with the second reminder (third mailing) having a much greater effect than the first one (second mailing). Indeed, while the effect of the first mailing and of the second reminder exceeded our expectations, the first reminder had an almost negligible direct effect on the response rate.

Figure 3.4. British survey: day-by-day results in terms of responses (RTS=Returns to Sender)



Source: The SIDS Project, British survey.

3.7.2. The Spanish survey

The sample frame used for the Spanish survey was retrieved through the databases of the Col·legi Oficial de Metges of Barcelona, Lérida and Tarragona, so that also for the Spanish survey the reputation of the frame keeper was not questionable. A possible shortfall of these sample frames could be that there is no legal obligation for physicians to register with a Col·legi an eventual specialty. As a result, the younger cohorts of paediatricians may have been slightly underrepresented in the sample frame (only the younger ones because in the 1990s there was a sort of a census of the physicians with specialties working in Catalunya). This could have been the source of some bias, and it may constitute some interesting area for future analysis. It is also worthy pointing out that the target population of the province of Barcelona also included 3rd and 4th year (out of 4) students of the specialty in paediatrics (residents). This choice was made by the local policymakers and these residents (93) are included in the numbers reported in Table 3.5 in order to present an

exhaustive report of the results achieved by the survey. However, in all the analyses reported in the other chapters the residents are not considered.

For the Barcelona survey, the required sample size for a target population of 1,157 paediatricians was of 289 responses. Taking into account the same estimates made for the British survey in terms of initial response rate and effect of reminders, the overall sample size would have been of 705. However, upon request of the Col·legi de Metges, it was decided to include all the 1,157 paediatricians in the survey. A similar decision was taken for the surveys carried out in the provinces of Lérida (85 registered paediatricians) and Tarragona (150 registered paediatricians).

The survey in Barcelona was run between October and December 2012, while those carried out in Lérida and Tarragona were run between January and March 2013. In order to take into proper consideration the linguistic diversity of the region (some people prefer to speak Catalan while others prefer to speak Spanish), each of the letters was printed on both sides of the page, one side in Catalan and one in Spanish. The postcard reminder, instead, could be sent only in Catalan because of space constraints. As for the questionnaire, the one that was included in the first mailing was in Catalan, while the one included in the last one was in Spanish. The web questionnaire could be filled in in Catalan or in Spanish according to the respondents' preferences. Once again, the coding process of the responses progressed in parallel with their collection, and, in order to avoid mistakes, each response was coded once and then checked separately.

Although the surveys were actually three (one for each province), in Table 3.5 they are presented as a single survey in order to allow simpler comparisons with Table 3.4. From Table 3.5 it is easy to see how the overall response rate was of 42.1%, and it is also possible to notice how we estimated the effect of the third reminder in +5 percentage points rather than in +10. This choice was made because we believed that the reminders' effect would decrease after the third mailing.

Table 3.5. Spanish survey's results in terms of responses

	Date of mailing	Working days	Envelopes sent	Received (valid)	Overall response rate	Estimated response rate
First mailing	Varied	9	1,392	267	19.2%	21.0%
First reminder	Varied	9	1,125	113	8.1%	10.0%
Second reminder	Varied	9	954	171	12.3%	10.0%
Third (e)reminder	Varied	Varied	919	35	2.5%	5.0%
Total	Varied	Varied	1,392	586	42.1%	46.0%

Source: The SIDS Project, Spanish survey.

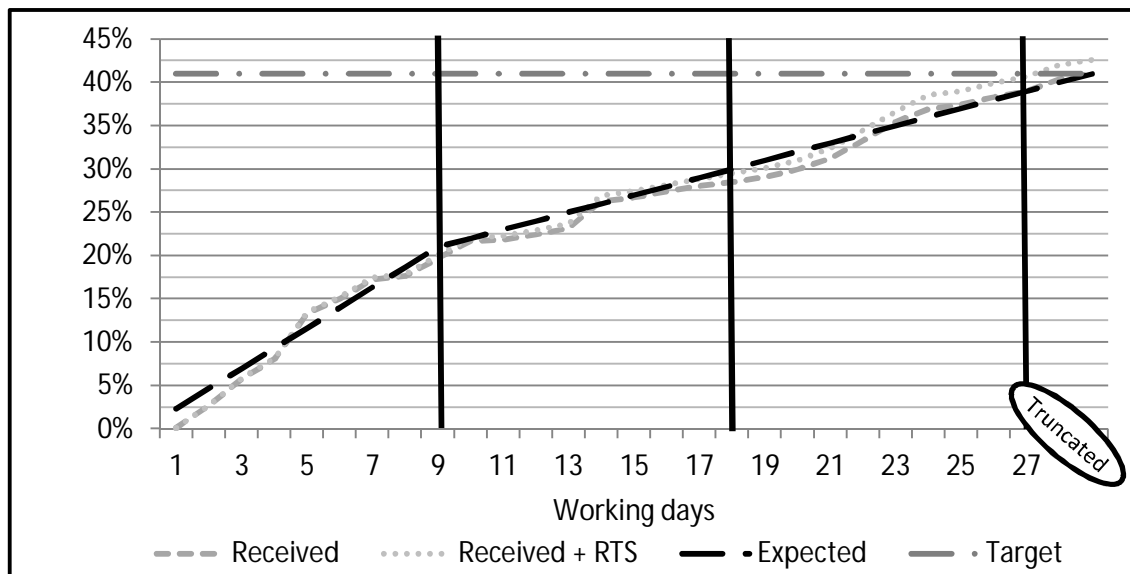
However, this rate needs to be adjusted to take into account certain members of the sample who did not reply for specific reasons. Of the 1,392 original members of the sample, in fact, the following should be removed for the reasons mentioned below:

- 48 sample members for retirement (returned to sender);
- 19 sample members for change of address (mailings returned to sender);
- 16 sample members for having a sub-specialty that implied no relations with newborns' parents;
- 15 sample members because they were over 70 years old;
- 1 sample member because he was deceased.

As a consequence, instead of calculating the response rate over 1,392, this should be done over 1,293, which implies an adjusted overall response rate of 45.3%. However, consistent differences exist between the adjusted response rates achieved in the different provinces. These, in fact, were of 42.7% in Barcelona, 54.0% in Tarragona and 67.1% in Lérida. Overall, instead, the adjusted response rate excluding the residents was of 45.9%.

Figure 3.5 shows the results of the survey in terms of achieved response rate day by day. The three reminders were sent on working days 9, 18 and 27. Once again, the data is pulled together from the three different surveys to make it comparable to Figure 3.4, and the '*expected*' and '*target*' lines have been calculated following the same procedure adopted for the British survey.

Figure 3.5. Spanish survey: day-by-day results in terms of response rate (RTS=Returns to Sender)



Source: The SIDS Project, Spanish survey.

In Figure 3.5 and Table 3.5 it is possible to see how the different mailings of the Spanish survey had an effect which was much closer to the expected one than in the case of the British survey. For each of the mailings the difference between the expected and the actual response rate was only about 2 percentage points (in the British survey this was up to 6 percentage points). As the original calculations were made without considering the additional (e)reminder (fourth mailing), we can see that the Spanish survey only reached a response rate of 39.4% against an expected result of 41%. This was due to the slight under-performance of the first mailing and the first reminder, which was only partially compensated by the over-performance of the second reminder.

With respect to the British survey, instead, it is possible to see how the reminders had an overall better performance, while the biggest difference is about the effect of the first mailing. Its effect was remarkably different between the two surveys: in fact, it implied an actual response rate of 27% in the British survey against an actual response rate of 19% in the Spanish one.

4. The Back-to-Sleep message among healthcare professionals in the last 20 years: a systematic review

From the late 1980s Back-to-Sleep (BTS) campaigns were run in most developed countries to increase awareness of the supine position's protective effect against SIDS. Once campaigns ended, healthcare professionals' role became crucial, as they represent the most important link in the chain connecting the latest scientific evidence and parents.

The goal of this chapter is to determine whether the correctness of healthcare professionals' knowledge and recommendations about infants sleeping positions has increased over the last 20 years. This is achieved using a systematic review of the literature, where all studies investigating healthcare professionals' knowledge and/or recommendations were included.

An analysis of the results of these studies revealed that the correctness of healthcare professionals' knowledge and recommendations about the supine sleeping position increased over the last 20 years. However, the percentage of those aware that parents should avoid putting their babies to sleep in a prone position is decreasing over time: from about 97% in the 1990s to about 90% at the end of the 2000s. The effectiveness of the BTS campaigns in publicizing the benefits of the supine position is thus confirmed. More and more healthcare professionals know that it is the best position to prevent SIDS and they recommend it exclusively. However, the decrease in the knowledge about non-prone positions suggests that the campaigns may not have focused enough on the dangers of the prone position.

4.1. Introduction

As mentioned in Sections 2.2 (page 15) and 2.5 (page 23), there have been some quite substantial changes in the SIDS prevention message over the last 20 years. The most famous change is the one referring to the sleep position. Nowadays it is commonly known that the supine sleep position is the best

position in order to reduce the risk of SIDS. However, in the recommendations that the AAP released in 1992, and then again in 2000, about SIDS prevention it was stated that any non-prone position was acceptable (Task Force on Infant Sleep Position and SIDS, 2000; Task Force on infant positioning and SIDS, 1992). It was only in 2005 that the supine position was recommended exclusively (Task Force on SIDS, 2005). In this chapter we want to assess how quickly the changes in the policy are translated into daily practice by healthcare professionals. In other words, we want to investigate how quickly, and to what extent, the changed advice was noted by professionals and their recommendations to parents updated accordingly.

In order to achieve this objective, we review systematically the findings of studies investigating the knowledge that healthcare professionals have about sleeping positions and the recommendations given by healthcare professionals to newborns' parents, and hence evaluate how the correctness of healthcare professionals' knowledge and recommendations about infant sleeping positions has changed over the last 20 years. Both knowledge and recommendations will be analysed. Since most studies have been conducted in the United States (US), special attention will be given to this case.

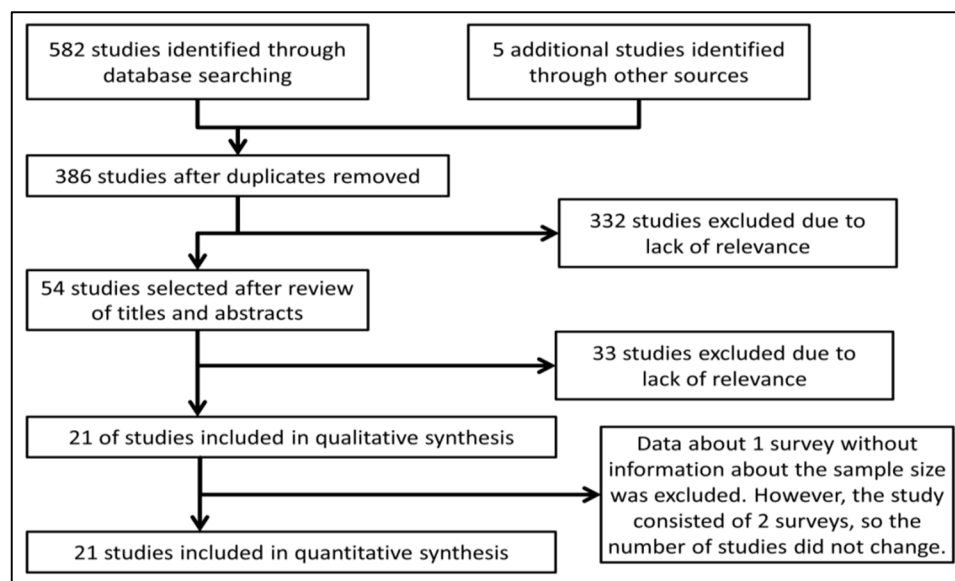
4.2. Methods

Studies were sought in the PubMed and Medline databases, using groups of keywords including '*SIDS*', '*knowledge*', '*recommendation(s)*', '*advice*', '*healthcare professionals*', '*doctors*', '*physicians*', '*nurses*', '*physicians*', '*paediatricians*', '*supine position*', '*non-prone position*', '*prone position*', '*prevention*' and '*reducing*'. Eligibility was assessed without reference to results, authors, or journals, and when the required data could not be extracted, the original authors were contacted. Experts in the field were consulted to identify other relevant studies. To ensure accuracy, two reviewers independently assessed eligibility of all the studies considered. Once the studies of interest were identified, both authors extracted data independently, and the results were compared. No differences were found between the two reviewers' outcomes.

A study was included if it investigated healthcare professionals' knowledge and/or recommendations about infant sleeping positions. Data regarding both the supine position alone and the non-prone positions were extracted. The

eligible studies involved family/general physicians, paediatricians, obstetrician-gynaecologists, other physicians, midwives, head nurses, Neonatal Intensive Care Unit (NICU) nurses, nursery nurses, and other nurses. All studies were published in peer-reviewed journals in English. A search of the databases was also performed in French, Italian and Spanish, but no eligible study published in these languages was found. Figure 4.1 provides a flowchart illustrating the selection of studies. The search was first undertaken in January 2012, it was then updated in February 2013 and, lastly, in May 2013.

Figure 4.1. Flowchart of systematic review and study selection



Source: The SIDS Project.

From each study we retrieved, where possible, four percentages relating to: (1) awareness of supine position being best (2) recommending supine position (3) awareness of non-prone position lowering risk and (4) recommending non-prone position. It was assumed that the following definitions described the same concept: *'healthcare professionals aware of the latest AAP recommendations for back and side sleeping position'*, *'healthcare professionals aware that term infants should be placed on their back to sleep'*, *'healthcare professionals aware that the supine position is a protective factor against SIDS'* and *'healthcare professionals aware that the supine position is associated with the lowest risk of SIDS'*. Some studies gave details about supine and non-supine positions, while others broke them down for all possible positions. With the latter it was possible to infer both the supine and the non-prone information, while with the former items (3) and (4) above could

not be retrieved. We only extracted figures that we were sure actually measured the outcomes we sought. We excluded other statistics, such as the proportion of newborns actually put to sleep in the supine position in the hospitals where surveys were conducted, as we were unsure that these reflected the personal knowledge or opinions of the respondents.

We summarize how these four percentages have changed over the last 20 years. If more than one study related to the same year, their average was taken and weighted according to their sample sizes. If a study presented data referring to periods both before and after a training course, only those preceding the training course were considered. Data collected over periods of more than one year were assumed to be valid for all relevant years. Calculations were made using absolute frequencies rather than percentages. We performed weighted regressions where the yearly weights were determined by the number of healthcare professionals surveyed. The use of weighted regressions accounts for the potential bias that may have been brought into the analysis by small studies (if treated with the same importance of bigger studies). It was not possible to fit meta-regressions to the data as not all the studies provided sufficient information.

4.3. Results

Of the 21 selected studies, the earliest was in 1992, while the newest was in 2009 (de Luca and Boccuzzo, 2013; Boccuzzo and de Luca, 2012; Eron et al., 2011; Yikilkan et al., 2011; Grazel et al., 2010; Shaefer et al., 2010; Young et al., 2010; Price et al., 2008; Moon et al., 2007b; Aris et al., 2006; Bullock et al., 2004; Stastny et al., 2004; Young and O'Rourke, 2003; Moon et al., 2002; Young and Schluter, 2002; Young et al., 2002; Delzell et al., 2001; Hein and Pettit, 2001; Morgan and Johnson, 2001; Ottolini et al., 1999; Peeke et al., 1999; Spieker and Brannen, 1996; Hudak et al., 1995; Scheidt et al., 1993). These 21 studies described 24 different surveys and 23 different published papers. Most of the surveys (19) were run in the US, three in Australia, one in Italy, and one in Turkey. For this reason, the results are presented with reference to the US, but the data relating to non-US surveys will also be included in the graphs. The average sample size of the studies included was 512 respondents (minimum=27, maximum=5,861) and the average response rate was 68.4% (minimum=23.5%, maximum=100%) (Table 4.1).

Table 4.1. Main characteristics of all the surveys of interest (some studies involve more than one survey)

Area	Year of study	Healthcare professionals ¹	Sample size	Response rate	Survey mode	Knowledge			Recommendations
						Supine	Non-prone	Supine	Non-prone
USA	1992	Paed, FamPhys, Phys, Nurses	630	73.3%	Telephone				54.6%
USA	1992	Head Nurses	79	100%	Telephone		92.4%	0%	67.1%
USA	1992	Paed, FamPhys	121	81.2%	Mail			4.0% ³	24.0% ³
USA	1993	Paed, FamPhys	121	81.2%	Mail		98.3%	16.0% ³	87.0% ³
USA	1993 ²	Paed	NA	NA	NA			77.0%	
USA	1995	FamPhys	209	69.7%	Mail			60.8%	
USA	1995-96	Phys	27	100%	Pap./pencil				84.0%
USA	1996	Nurses	103	47.0%	Pap./pencil		97.1%		
USA	1997	Paed	34	81.0%	NA			35.3%	100%
USA	1998	Head Nurses	94	100%	Mail				90.5%
USA	1999	Head Nurses	75	100%	Telephone		100%	26.7%	100%
USA	1999	Paed, FamPhys, ObsGyn	835	22.5%	Mail	52.6%			
USA	2000	Nurses	528	31.6%	Mail	44.0%	96.0%		82.0%
USA	2000	Nursery Nurses	96	NA	NA	71.6%		33.7%	98.9%
USA	2002/04	Paed, FamPhys, ObsGyn	214	23.5%	Mail	72.3%			
USA	2003/04	NICU Nurses	252	49.0%	Mail			52.0%	98.8%
USA	2004/05	Nursery Nurses	530	NA	NA			55.1%	97.9%
USA	2004/07	Nurses	395	62.2%	NA	84.8%			
USA	2005	Paed, FamPhys	783	26.1%	Mail	77.5%	95.8%	69.6%	96.7%
USA	2007/08	NICU Nurses	430	39.8%	NA	60.5%	87.0%	84.0%	
Austr.	2001	Nurses, Midw	36	100%	Pap./pencil	91.7%	100%	77.8%	100%
Austr.	2001/02	Nurses, Midw	959	81.1%	Mail	70.9%	99.3%	61.2%	99.5%
Austr.	2006/07	Nurses, Midw	220	59.0%	Mail	82.0%		78.0%	100%
Other	2008 ²	Paed, FamPhys, Phys, Nurses, Midw	174	90.6%	Face to face	16.7%	89.7%	10.8%	67.0%
Other	2008/09	Paed, ObsGyn, Phys, Nurses, Midw	4,533	NA	Pap./pencil	89.6%		61.2%	82.4%

¹ Paed = Paediatricians, FamPhys = Family Physicians, ObsGyn = Obstetricians-Gynaecologists, Phys = Other Physicians, Midw = Midwives.

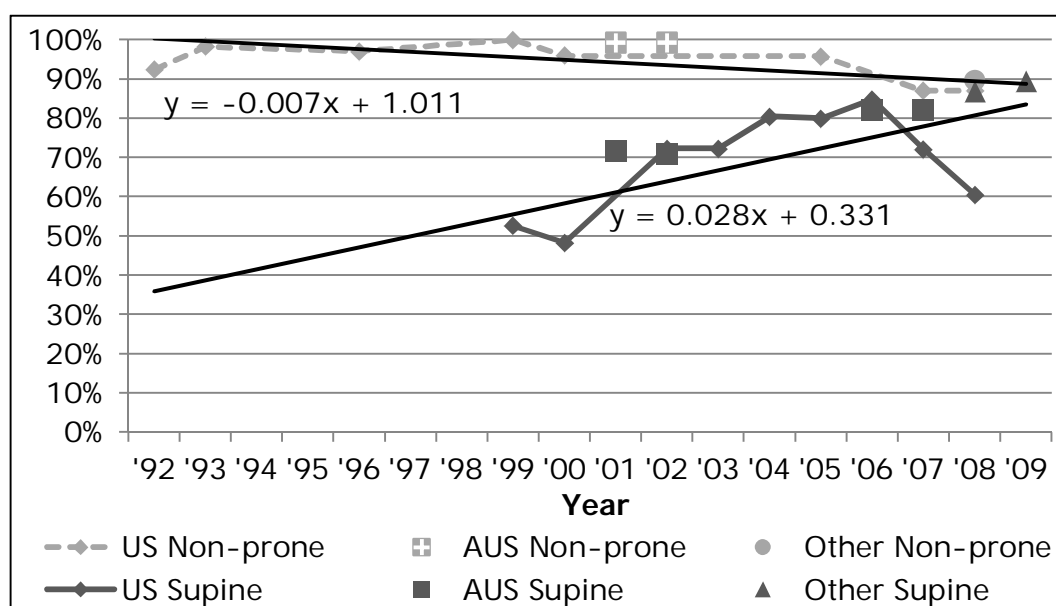
² Estimated with the procedure mentioned in the Methods.

³ Estimated by eye from a graph in the original article

Source: The SIDS Project.

The percentage of healthcare professionals aware that the supine position is the best for reducing the risk of SIDS has increased in the US over the last 20 years (Figure 4.2). However, the slope of the trend of knowledge of the benefits of any non-prone position is negative, implying that over the last 20 years the percentage of healthcare professionals aware that any non-prone position would be preferable to prone has been decreasing. Such a result may indicate that, while awareness that the supine position is the best for reducing the risk of SIDS increased over time, fewer people are aware of the particular dangers of the prone position. The results of non-US studies seem to be comparable to those of the US, especially concerning knowledge of the dangers of the prone position.

Figure 4.2. Percentage of healthcare professionals aware that the supine or any non-prone sleeping position is the most effective in reducing the risk of SIDS: United States, Australia and Other Countries



'Supine' refers to healthcare professionals who were aware that the supine position only was the most effective. 'Non-prone' refers to those who thought either lateral or supine positions or both were more effective than the prone position, but who did not make the distinction between the lateral and the supine positions. Regression lines are weighted by the total sample size reported in the studies made in each year. For sources see Table 4.1.

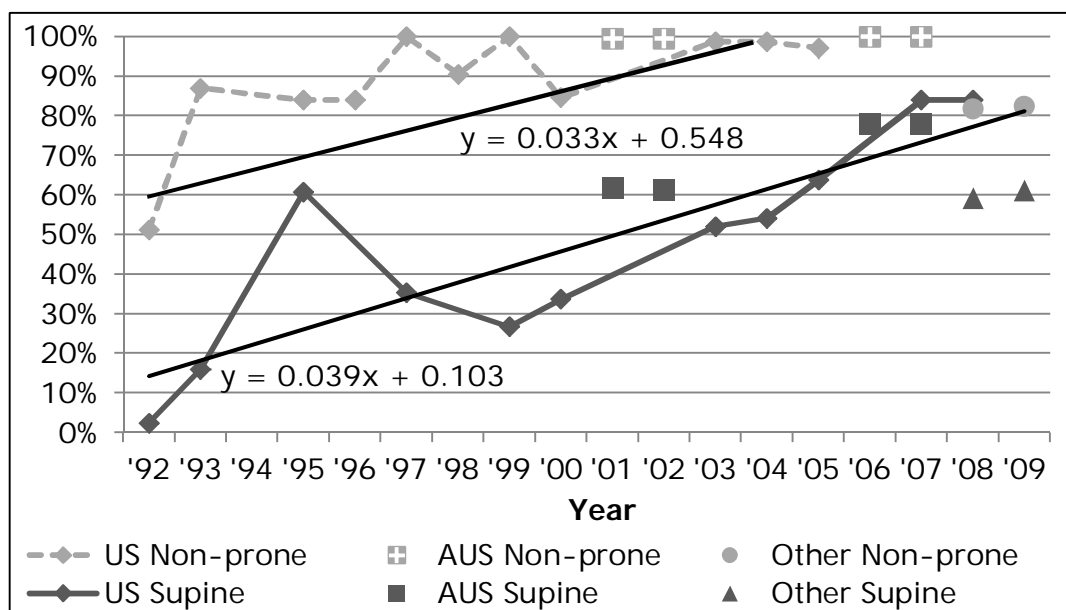
Source: The SIDS Project.

The respondents in the studies reviewed came from a variety of healthcare professions. Three US studies and one other study presented data specific to particular groups, all of which demonstrated that the paediatricians' knowledge of the risks of different sleep positions is greater than that of other

healthcare professionals (the difference between paediatricians and others in knowledge that the supine position has the lowest risk ranging from 14 to 30 percentage points) (Boccuzzo and de Luca, 2012; Moon et al., 2007b; Moon et al., 2002; Scheidt et al., 1993).

We observe an increasing trend in the percentage of healthcare professionals recommending both exclusively the supine position and a non-prone one (Figure 4.3).

Figure 4.3. Percentage of healthcare professionals recommending newborns' parents the supine or any non-prone sleeping position: United States, Australia and Other Countries



'Supine' refers to healthcare professionals who were aware that the supine position only was the most effective. 'Non-prone' refers to those who thought either lateral or supine positions or both were more effective than the prone position, but who did not make the distinction between the lateral and the supine positions. Regression lines are weighted by the total sample size reported in the studies made in each year. For sources see Table 4.1.

Source: The SIDS Project.

In the case of the non-prone position, this result contradicts the trend in reported knowledge described in Figure 4.2, although we have no data on recommendations about the non-prone position for the years after 2005, when awareness of the particular dangers of the non-prone position is at its lowest. Moreover, while the Australian results seem to be better than the American ones, those belonging to other countries reveal a set of recommendations less beneficial to infants than in the US, and these two studies are the most recent.

In the only study which compared the recommendations of different types of healthcare professional, 74% of paediatricians but only 62% of other health care professionals would recommend the supine position (Moon et al., 2007b).

4.4. Discussion

This study generates the first comprehensive analysis of the effect of the BTS campaigns on healthcare professionals' knowledge and recommendations about infants sleeping positions since 2005 (Raydo and Reu-Donlon, 2005). All the results are based on published data. The percentages of healthcare professionals aware that the supine position is best for reducing the risk of SIDS and recommending newborns' parents use the supine position exclusively have been increasing over the last 20 years in parallel with the increasing number and extent of BTS campaigns, mainly focused in getting the message that '*back is best*' through to the population. This suggests that the BTS message reached healthcare professionals as well as newborns' parents. Once campaigns are over healthcare professionals are the most important conduit through which the message is transmitted to parents.

A surprising result of this analysis was that the percentage of healthcare professionals believing that any non-prone position implied a lower risk of SIDS has decreased over the last 20 years. This data could be interpreted as suggesting that the BTS campaigns concentrated all their energies in publicizing the benefits of the supine position without sufficiently stressing the dangers of the prone position. On the other hand, it could be argued that, as far as newborns' parents are concerned, what healthcare professionals recommend is more important than what they claim to know. By 2004, almost 100% of healthcare professionals were recommending a non-prone position.

When knowledge is considered, non-US studies show results similar to the US ones, if not better. In 1987 Australia had the highest SIDS rate of any large country (Table 4.1) but its SIDS rate has since converged with those of other countries, and is now lower than that of the US. Our results show that in relation to both awareness and recommendations, Australia has been performing better than the US, suggesting that there may be an association between the quality of the information possessed by health care professionals and the reduction in the SIDS rate.

When making recommendations, healthcare professionals have to (or should) comply with the guidelines of their country, regardless of their knowledge, opinions and beliefs. This is not true when knowledge is considered, as each healthcare professional can undergo further training or further reading from the literature as he/she deems it necessary. The last two non-US studies included in this review belong to Italy and Turkey: in Italy the first national BTS campaign was run only in 2008, and in Turkey it was not possible to determine whether a national BTS campaign was ever implemented. The response of healthcare professionals in these two countries to the question about recommendations, then, could be explained by the level of attention given by local policymakers to this issue over the last 20 years.

The analysis reported in this chapter has limitations: the number of studies is small, as this field has not yet been extensively explored. This may limit the impact of publication bias on the analysis, but it also implies that the results of the chapter may be less accurate. While the trend was largely constructed on the basis of US studies, the most recent data belong only to other countries, and this may imply problems in terms of comparability. The reliability of the trend lines may be influenced by the estimates that were made where the year of the surveys was unknown and by the hypothesis that, in case of surveys carried out over more than one year, their data was assumed to relate to all relevant years. The quality of the information in the studies reviewed may vary according to the mode of the survey (face-to-face, telephone, mail, etc.). Unfortunately, there are insufficient studies for us to be able to stratify on the basis of survey mode, and some studies did not indicate how the survey was conducted (Table 4.1).

4.5. Conclusions

The BTS campaigns and the advice given by authorities such as the AAP have been effective in helping raising awareness among healthcare professionals of the relative risks of SIDS associated with different infant sleeping positions. Knowledge of the effect of sleep position on the risk of SIDS has been acquired in phases. Awareness that the prone position was dangerous has been over 90% since 1992, and awareness that the supine position is associated with the lowest risk of SIDS rose between 2000 and 2010 from about 50% to almost 80%. Recent studies, however, show that the supine

position is much better than either the prone or the lateral position, and there is still some way to go to raise awareness of this. Evidence in favour of the supine position has continued to accumulate, and the latest evidence suggests that SIDS risks from the lateral and the prone positions are similar (Moon et al., 2011; Li et al., 2003; Mitchell et al., 1997; Fleming et al., 1996).

Most recommended interventions to reduce the risk of SIDS, notably that concerning the sleep position, are to be implemented in the home (Task Force on SIDS, 2005). Parents therefore need access to the best and most up to date information. Once most BTS campaigns ended, healthcare professionals' role became crucial, since they bridge the gap between parents and the latest scientific evidence.

The percentage of healthcare professionals aware that any non-prone position would be better than the prone position has been decreasing over the last 20 years, which may reflect changes in knowledge of the relative risks of the prone and lateral positions due to recent research.

The percentage of healthcare professionals recommending newborns' parents use the supine sleeping position alone, or, at least, a non-prone sleeping position, has been increasing. This second result is more important than the one about healthcare professionals' knowledge, as the recommendations are, in the end, what will influence parents' choice in putting their babies to sleep. The percentage of healthcare professionals recommending the supine position exclusively is now around 80%. This is still too low, and further efforts are needed to increase it in order to reduce the risk of SIDS among the population. There is still opposition to the supine recommendation, as revealed in the debates and posts on <http://www.parentsconnect.com/parenting-your-kids/baby/sleep/back-to-sleep-campaign-research.html> or on <http://www.circleofmoms.com/after-pregnancy-babies-and-infants/is-it-safe-to-let-my-baby-sleep-on-her-stomach-298826#> (both accessed on 13 February 2013).

Further effort is needed to understand the relationship between healthcare professionals' awareness of the risks of different sleeping positions and their decisions to recommend certain sleeping positions over others. Moreover, it is important to gather more recent data from the US, in order to get a better understanding on how the trend has evolved in the last few years.

5. The effectiveness of the Back-to-Sleep message among healthcare professionals in Italy

The aim of this chapter is to determine which characteristics influence healthcare professionals' knowledge and recommendations about infants sleep positioning. The chapter analyses data from a cross-sectional survey of 6,081 healthcare professionals who chose to participate in a training campaign about the prevention of SIDS.

The results show that, overall, 5,335 respondents (88%) were aware that the supine position has a protective effect towards SIDS, a percentage that reached 97% for paediatricians (1,062/1,092) and only 79% for physicians other than paediatricians and obstetricians (434/551). Only 58% of respondents (n=3,102) recommended exclusively the supine sleeping position to infants' parents, while 78% (n=4,168) recommended a non-prone position. These two percentages were of 70% and 83% for paediatricians and of 50% and 71% for physicians other than paediatricians and obstetricians. Paediatricians were more likely to have a correct knowledge and give correct recommendations, while healthcare professionals belonging to medical clinics, hospitals, districts, and departments of public health presented worse results than all the other healthcare professionals. Geographical differences also existed, with healthcare professionals from the North performing better than their colleagues from the Centre and the South and Islands.

The chapter concludes that overall knowledge about infants sleep positioning is satisfying, especially among paediatricians, who are the most important source of information for parents. However, much more needs to be done in order to raise the percentage of professionals in medical clinics and certain other institutions recommending exclusively the supine sleep position.

5.1. Introduction

From 2007 to 2009, the Italian Ministry of Health promoted at a national level the campaign GenitoriPiù, which was aimed at promoting simple actions proven effective for the prevention of major childhood risks. The campaign was initially launched at a regional level in 2006 in Veneto, and the prevention of SIDS was among the interventions composing the core message of the campaign. The other interventions were: abstention from smoking, breastfeeding, sleeping position, folic acid intake, use of infant car seats, immunizations, reading aloud, and counselling.

To achieve the best results, the campaign was structured into two sub-campaigns: an informative campaign, which directly delivered the message to infants' parents through the use of posters, leaflets, television announcements and a dedicated web-page; and a training campaign, which delivered healthcare professionals the appropriate knowledge on these topics. The target population for this second campaign consisted of all healthcare professionals involved in all the phases of the pregnancy, including, but not limited to, gynaecologists, obstetricians, paediatricians, nurses and healthcare assistants.

Before the beginning of the training campaign, a survey concerning the attitudes and knowledge of these healthcare professionals was carried out between September 2008 and June 2009. The campaign was conducted on a national level but the timing and the organisation of all the training courses were delegated to the regions. The message that was delivered to healthcare professionals, however, was the same in all the regions, so that the required preparation did not change among different regions. To achieve such an outcome, a central training programme was administered to all individuals who would later be in charge of the regional training. This was the first campaign of this kind at a national level in Italy.

The questionnaire used for the campaign's survey was composed of an opening section that gathered information on the background of the respondent, and eight sections on the topics that represented the core messages of the campaign. The questionnaire was filled in directly by the healthcare professionals in paper form. Knowledge, attitudes, and personal opinions were surveyed within each section of the questionnaire.

Here the focus is solely on the section about SIDS, and the main aim of this chapter is to measure, for the first time in Italy, healthcare professionals'

knowledge and recommendations about the safest sleep position, and to draw the first comparisons with their American colleagues.

5.2. Materials

Eleven Italian regions (Abruzzo, Aosta Valley, Apulia, Calabria, Emilia Romagna, Friuli Venezia Giulia, Lazio, Molise, Sardinia, Umbria, and Veneto) and 2 Milan Local Health Units (known in Italian as ASLs) participated in the survey, and a total of 6,081 questionnaires were collected. The survey cannot be considered representative of the Italian population of healthcare professionals, since it is based only on data collected from healthcare professionals belonging to the participating regions. Unfortunately, it was not possible to conduct any assessment of the differences between the regions that participated in the survey and those that did not, as a central database that would permit a comparison does not exist, and the records regarding each single region are not all publicly available. On the other hand, this is the first survey on this topic which includes regions from the length and breadth of Italy, so the findings are particularly important. This is especially the case when considering the objectives of a special law enacted in 2006, which provides for the promotion of awareness and prevention campaigns to ensure accurate information dissemination for SIDS, and for the development of guidelines (2 February 2006, law n. 31, art. 4).

To facilitate the interpretation of the results, the regions involved in the training campaign have been grouped according to the macro-region of Italy in which they are situated: the North (Aosta Valley, Emilia Romagna, Friuli Venezia Giulia, Lombardy [only two Local Health Authority], and Veneto), the Centre (Lazio and Umbria), and the South and Islands (Abruzzo, Apulia, Calabria, Molise, and Sardinia).

The response rate to the survey was 99%. The questionnaire that was distributed contained a section for each of the campaign's interventions mentioned above, but this analysis focuses solely on the questions that referred to the Back-To-Sleep (BTS) recommendations.

Besides the region and the Local Health Authority (ASL) to which the healthcare professionals belonged, the background variables included in the questionnaire were: gender, age (in classes), years of professional experience (in classes), professional role (paediatrician, obstetrician, nurse, healthcare

assistant, physician [other than paediatrician and obstetrician], other), and workplace (birth centre, medical clinic, family planning clinic, department of public health, vaccinations centre, hospital, district, other).

5.3. Methods

Descriptive statistics were calculated both for the demographic characteristics of the sample and for the questions of interest, and a p-value smaller than 0.05 defined statistical significance. Given the small number of available covariates, all of them were used in the analysis. Groups were compared by using chi-square tests for categorical data. However, due to the high correlation between age and seniority (Spearman's $\rho=0.572$), the latter one was soon dropped from the multivariate analysis.

Multivariate analyses (log binomial models) were used to examine demographic and professional variables as predictors of healthcare professionals' knowledge and compliance with the AAP recommendations. We could not use logistic regression to model the data because the phenomenon of interest had a prevalence which was above 10% (Davies et al., 1998), so it was not possible to rely on the approximation of the risk ratios (RRs) given by the odds ratios (ORs) and the logistic regression (Greenland, 1987). As a consequence, we modelled the data with some log binomial regressions. The log binomial model that was adapted to the data (Wacholder, 1986) belongs to the Generalized Linear Models family and is characterized by a logarithmic link function and a binomial distribution:

$$\Pr(Y_i = 1 | \mathbf{x}_i) = e^{\mathbf{x}_i' \boldsymbol{\beta}} \quad (5.1)$$

where:

Y_i indicates the dichotomous random variable for the i -th respondent;

$\mathbf{x}_i' = \{x_{i1}, \dots, x_{iS}\}$ indicates the values of a set of S covariates for the i -th respondent;

$\boldsymbol{\beta} = \{\beta_0, \beta_1, \dots, \beta_S\}$ indicates the $(S+1)$ regression parameters.

The biggest limitation of this model is represented by its high failure rate (Blizzard and Hosmer, 2006), mainly caused by (1) predicted probabilities that are not bounded between 0 and 1 (this is a consequence of using a logarithmic link function instead of a logit); and (2) computational issues that can lead to

the non-convergence of the model. In the models that we present the predicted probabilities of a positive outcome for the model varied between 0 and 1 and all estimates were retrieved after a successful convergence of the model. However, we detected one of these drawbacks when we tried to include the interaction between gender and professional role in the model (which would have been reasonable given the different distribution of professional roles between males and females—females are significantly more likely than males to be obstetricians, and among nurses more females specialise in newborn care). In this case, the model failed to converge (a well-known problem of this tool - Blizzard and Hosmer, 2006). However, we believed that the possibility of giving readers and policymakers RRs rather than ORs outweighed this disadvantage.

All the analyses were performed using the statistical software STATA. (StataCorp, 2011), and the log binomial regressions were performed using the `binreg` command (Hardin and Cleves, 1999).

5.4. Results

Of the 6,081 respondents, 2,005 (34%) were nurses, 1,092 (18%) were paediatricians, 964 (16%) were obstetricians, and 2,020 (32%) represented other professional figures (healthcare assistants and other medical specialties). The vast majority of the respondents were females (5,070, 87%), 3,737 respondents (63%) were at least 45 years old and only 639 (11%) were aged less than 35 years. The majority of the respondents (3,899, 64%) worked in the North of Italy, while 908 (15%) worked in the Centre and 1,274 (21%) in the South and the Islands (Table 5.1).

Considering the questions regarding the BTS message, healthcare professionals were initially asked to identify the effect of supine sleeping towards SIDS. 5,335 respondents (88%) correctly identified the supine position as a protective factor against SIDS, 455 (7%) stated that it did not protect against SIDS, and 148 (2%) declared that they did not know the answer to the question (Table 5.2).

Table 5.1. Demographic and professional background of respondents

Variable		Frequency (%)
Gender:	Females	5,070 (87)
	Males	778 (13)
Age:	Less than 35 years old	639 (11)
	35-44 years old	1,608 (27)
	45-54 years old	2,724 (46)
	More than 54 years old	1,013 (17)
Professional role:	Healthcare Assistant	619 (10)
	Nurse	2,005 (34)
	Obstetrician	964 (16)
	Paediatrician	1,092 (18)
	Physician (others)	551 (9)
	Other roles	758 (13)
Years of experience:	Less than 10	1,305 (23)
	From 10 to 19	1,718 (30)
	From 20 to 29	1,928 (34)
	More than 29	743 (13)
Workplace:	Birth Centre ^a	1,217 (21)
	Dept. of Public Health	918 (16)
	District	340 (6)
	Family Planning Clinic	1,021 (17)
	Hospital	605 (10)
	Medical Clinic	956 (16)
	Vaccinations Centre	614 (10)
	Other workplaces	261 (4)
Macro-region:	North	3,899 (64)
	Centre	908 (15)
	South and Islands	1,274 (21)

^a the Birth Centre is a special hospital ward which is specialized in assisting mothers and newborns during labour and the following hours.

Source: GenitoriPiù national campaign, healthcare professionals' survey.

Table 5.2. Knowledge of supine sleeping's effect towards SIDS

Variable		Correct	Incorrect	I do not know	Do not reply	χ^2 p-value
Overall		5,335 (88%)	455 (7%)	148 (2%)	143 (2%)	
Gender:	Females	4,496 (89%)	343 (7%)	110 (2%)	121 (2%)	<0.001
	Males	647 (83%)	89 (11%)	31 (4%)	11 (1%)	
Age:	< 35 years	548 (86%)	57 (9%)	25 (4%)	9 (1%)	0.039
	35-44 years	1,432 (89%)	118 (7%)	34 (2%)	24 (1%)	
	45-54 years	2,408 (88%)	183 (7%)	62 (2%)	71 (3%)	
	> 54 years	865 (85%)	87 (9%)	25 (2%)	36 (4%)	
Professional role:	Health. Assistant	542 (88%)	49 (8%)	11 (2%)	17 (3%)	<0.001
	Nurse	1,768 (88%)	145 (7%)	50 (2%)	42 (2%)	
	Obstetrician	854 (89%)	80 (8%)	14 (1%)	16 (2%)	
	Paediatrician	1,062 (97%)	18 (2%)	3 (0%)	9 (1%)	
	Physician (others)	434 (79%)	77 (14%)	25 (5%)	15 (3%)	
	Other roles	601 (79%)	76 (10%)	44 (6%)	37 (5%)	
Years of experience:	Less than 10	1,143 (88%)	93 (7%)	43 (3%)	26 (2%)	0.071
	From 10 to 19	1,524 (89%)	132 (8%)	39 (2%)	23 (1%)	
	From 20 to 29	1,721 (89%)	134 (7%)	31 (2%)	42 (2%)	
	More than 29	639 (86%)	57 (8%)	21 (3%)	26 (4%)	
Workplace:	Birth Centre	1,107 (91%)	68 (6%)	24 (2%)	18 (1%)	<0.001
	Dept. of Public Health	774 (84%)	97 (11%)	28 (3%)	19 (2%)	
	District	269 (79%)	38 (11%)	13 (4%)	20 (6%)	
	Family Planning Clinic	897 (88%)	75 (7%)	18 (2%)	31 (3%)	
	Hospital	524 (87%)	50 (8%)	19 (3%)	12 (2%)	
	Medical Clinic	895 (94%)	39 (4%)	11 (1%)	11 (1%)	
	Vaccinations Centre	538 (88%)	52 (8%)	13 (2%)	11 (2%)	
	Other workplaces	210 (80%)	21 (8%)	17 (7%)	13 (5%)	
Macro-region:	North	3,581 (92%)	177 (5%)	82 (2%)	59 (2%)	<0.001
	Centre	727 (80%)	122 (13%)	35 (4%)	24 (3%)	
	South and Islands	1,027 (81%)	156 (12%)	31 (2%)	60 (5%)	

Source: GenitoriPiù national campaign, healthcare professionals' survey.

Female respondents' correct knowledge of the topic was 6 percentage points higher than males'. Respondents aged between 35 and 54 answered correctly in about 89% of the cases against the almost 86% of the others. Among professional roles, paediatricians knew the correct effect of prone sleeping in 97% of the cases (1,062/1,092), while this percentage was around 88% for obstetricians (854/964), nurses (1,768/2,005), and healthcare assistants (542/619), and only 79% for physicians (others than paediatricians and obstetricians, 434/551). A large difference was also discovered between macro-regions, with the healthcare professionals belonging to the North showing a higher degree of knowledge than their colleagues from the Centre and the South and Islands by more than 10 percentage points.

After the first question, all the respondents who declared that they discussed with parents the infants' sleep position at least '*seldom*' (n=5,323) were asked to state which recommendations they used to give about this topic. Overall, the percentage of healthcare professionals giving parents correct recommendations (i.e. supine only) was quite low (n=3,102, 58%), and, even taking into account all the non-prone recommendations, it did not exceed 78% (n=4,148) (Table 5.3). In this circumstance, where the gap between knowledge/awareness and recommended practice was very large, the analysis of behaviour of the various groups was even more crucial.

The correctness of the recommendations did not vary across ages and varied very little across genders. However, if all the non-prone recommendations are considered, females outperform males by 4 percentage points (79% vs. 75%). Moreover, it is possible to notice a decreasing percentage of non-prone recommendations as respondents' age increases. When professional roles are considered, paediatricians still do better at recommending low risk practices than all the other roles, with a percentage of correct recommendations of 70% and a percentage of non-prone recommendations of 83%. As in Table 5.2, physicians (others than paediatricians and obstetricians) and other healthcare professionals presented consistently lower percentages, both in terms of supine and non-prone recommendations (around 50% and 70%). Finally, if the macro-regions are considered, the healthcare professionals belonging to the Northern regions exceed the performance of their colleagues, especially in terms of correct recommendations (a difference of about 10 percentage points). In case of non-

prone recommendations, instead, their performance is almost the same of the healthcare professionals belonging to the Centre.

Table 5.3. Recommendations about infants sleep positioning

Variable	Supine only	Lateral (& Supine) ^a	Other pos.	No specific position	Do not reply	χ^2 p-value
Overall	3,102 (58%)	1,066 (20%)	74 (1%)	76 (1%)	1,005 (19%)	
Gender: Females	2,604 (58%)	919 (21%)	53 (1%)	57 (1%)	828 (19%)	0.002
Males	388 (59%)	108 (16%)	12 (2%)	18 (3%)	132 (20%)	
Age: < 35 years	325 (60%)	132 (24%)	8 (1%)	9 (2%)	71 (13%)	0.525
35-44 years	834 (60%)	304 (22%)	16 (1%)	18 (1%)	229 (16%)	
45-54 years	1,406 (59%)	438 (18%)	32 (1%)	36 (2%)	474 (20%)	
> 54 years	491 (54%)	171 (19%)	13 (1%)	13 (1%)	217 (24%)	
Prof. role: Health. Ass.	286 (59%)	83 (17%)	7 (1%)	9 (2%)	103 (21%)	<0.001
Nurse	1,005 (56%)	421 (24%)	22 (1%)	20 (1%)	316 (18%)	
Obstetrician	541 (58%)	212 (23%)	11 (1%)	19 (2%)	150 (16%)	
Paediatrician	768 (70%)	138 (13%)	9 (1%)	7 (1%)	168 (15%)	
Physician (others)	194 (50%)	83 (21%)	8 (2%)	8 (2%)	95 (24%)	
Other roles	268 (48%)	112 (20%)	13 (2%)	13 (2%)	154 (28%)	
Years of exp.: Less than 10	622 (58%)	239 (22%)	9 (1%)	15 (1%)	192 (18%)	0.139
From 10 to 19	906 (60%)	306 (20%)	25 (2%)	13 (1%)	254 (17%)	
From 20 to 29	1,023 (59%)	311 (18%)	19 (1%)	26 (2%)	342 (20%)	
More than 29	376 (57%)	136 (20%)	9 (1%)	11 (2%)	132 (20%)	
Workpl.: Birth Centre	732 (63%)	226 (19%)	8 (1%)	15 (1%)	184 (16%)	<0.001
Dept. of Pub. Health	380 (53%)	184 (26%)	10 (1%)	10 (1%)	137 (19%)	
District	122 (47%)	61 (24%)	2 (1%)	3 (1%)	70 (27%)	
Fam. Planning Clinic	543 (59%)	174 (19%)	18 (2%)	19 (2%)	164 (18%)	
Hospital	291 (53%)	146 (27%)	6 (1%)	4 (1%)	103 (19%)	
Medical Clinic	588 (65%)	126 (14%)	10 (1%)	7 (1%)	167 (19%)	
Vaccinations Centre	279 (59%)	72 (15%)	9 (2%)	10 (2%)	103 (22%)	
Other workplaces	107 (52%)	46 (22%)	3 (1%)	6 (3%)	43 (21%)	
Macro-region: North	2,099 (62%)	594 (18%)	32 (1%)	50 (1%)	610 (18%)	<0.001
Centre	440 (54%)	210 (26%)	17 (2%)	15 (2%)	134 (16%)	
South and Islands	563 (50%)	262 (23%)	25 (2%)	11 (1%)	261 (23%)	

^a the column '*lateral (& supine)*' represents the respondents who only recommend the lateral position or the lateral position together with the supine position. The sum of the columns '*supine*' and '*lateral (and supine)*' gives the amount of respondents recommending a non-prone position.

Source: GenitoriPiù national campaign, healthcare professionals' survey.

In order to properly understand the role of each background variable in determining the correctness of the healthcare professionals' knowledge and recommendations, we considered them all together by adapting two log binomial models to the data (Table 5.4). Both models refer to the risk of having given a wrong answer (i.e. coded 1 for those who did NOT have a correct knowledge and for those who did NOT give correct recommendations). In the knowledge model the sets of answers that were considered were '*correct*' (Table 5.2) vs. all other responses, while in the recommendations model the sets were '*supine only*' (Table 5.3) vs. all other responses.

Table 5.4. Determinants of healthcare professionals' wrong knowledge and recommendations about infants sleep positioning

Variable	Category	Knowledge		Recommendations	
		Relative Risk	95% CI	Relative Risk	95% CI
Gender:	Female	1	<i>ref.</i>	<i>non sig.</i>	-
	Male	1.89	(1.52-2.34)	<i>non sig.</i>	-
Age:	More than 54 years old	1	<i>ref.</i>	1	<i>ref.</i>
	Less than 35 years old	<i>non sig.</i>	-	0.91	(0.75-1.11)
	35-44 years old	<i>non sig.</i>	-	0.88	(0.75-1.03)
	45-54 years old	<i>non sig.</i>	-	0.86	(0.75-0.99)
Professional role:	Paediatrician	1	<i>ref.</i>	1	<i>ref.</i>
	Healthcare Assistant	8.12	(4.62-14.28)	1.70	(1.31-2.21)
	Nurse	7.20	(4.25-12.20)	1.92	(1.54-2.39)
	Obstetrician	8.81	(5.07-15.32)	2.08	(1.64-2.63)
	Physician (others)	9.30	(5.56-15.57)	1.91	(1.50-2.44)
	Other roles	9.10	(5.32-15.56)	1.77	(1.37-2.28)
Workplace:	Birth Centre	1	<i>ref.</i>	1	<i>ref.</i>
	Dept. of Public Health	1.77	(1.35-2.31)	1.49	(1.27-1.75)
	District	1.72	(1.23-2.40)	1.40	(1.11-1.77)
	Family Planning Clinic	1.06	(0.80-1.40)	1.10	(0.93-1.29)
	Hospital	1.67	(1.22-2.28)	1.46	(1.22-1.73)
	Medical Clinic	1.65	(1.14-2.39)	1.31	(1.04-1.66)
	Vaccinations Centre	1.29	(0.93-1.78)	1.07	(0.86-1.32)
	Other workplaces	1.44	(0.98-2.12)	1.28	(0.99-1.66)
Macro-region:	North	1	<i>ref.</i>	1	<i>ref.</i>
	Centre	2.35	(1.94-2.85)	1.43	(1.26-1.61)
	South and Islands	1.89	(1.57-2.28)	1.39	(1.23-1.56)

Source: GenitoriPiù national campaign, healthcare professionals' survey.

In the model referring to the knowledge (Table 5.4), males present a significantly higher risk than females (by about 90%) of not knowing that the supine position protects against SIDS. Respondents working in Medical Clinics, Hospitals, Districts, and Departments of Public Health also present higher RRs (by about 70%) than all their other colleagues. In terms of macro-regions, the respondents who work in the South and Islands present a RR of not knowing the protective effect of the supine position which is almost 90% higher than their colleagues in the North, while for those working in the Centre this risk increases by about 135%. However, the most important role is played by the respondents' professional role, with extremely high RRs when all other roles are compared with paediatricians. The magnitude of these RRs does not depend exclusively on a low performance of the other roles (some of them present a degree of correct knowledge of about 90%, see Table 5.2), but also on the high degree of knowledge that paediatricians, who represent the reference category, have on this topic. These RRs suggest that despite delivering the BTS message effectively to paediatricians, there is still work to be done to spread it among the other healthcare professionals.

In the second model in Table 5.4, there is no gender effect, but the effect of age, negligible in the first model, is significant. In particular, healthcare professionals aged between 45 and 54 (that is, approximately, those belonging to the birth cohorts 1954-1963) present a significant RR of 0.86, which implies a likelihood of giving parents wrong recommendations which is 14% lower than that of all the other respondents. As it might have been expected, paediatricians are the healthcare professionals who most likely give correct recommendations, while all the other roles present a risk of giving wrong recommendations which is at least 70% higher. In terms of workplace, it emerges that the healthcare professionals presenting higher RRs (about 40% higher than those in Birth Centres) are those who work in medical clinics, districts, hospitals, and Departments of Public Health, the same workplaces that showed poor results also in terms of knowledge. Finally, respondents working in the Centre and in the South and Islands show a risk of giving incorrect recommendations to parents which is about 40% higher than that of their colleagues working in the North.

5.5. Discussion

SIDS is the leading cause of death among infants below 1 year of age. The sleeping position has been identified as one SIDS preventing strategy, being the supine position the one associated with the lowest rate of incidence (Task Force on SIDS, 2011a; Gilbert et al., 2005).

In order to reduce the risk of SIDS, it is essential that parents receive the best and most up-to-date information about this topic. Even though parents might try to gather this information through several sources, the healthcare professionals that they deal with are still one of their most important sources of advice. The role played by healthcare professionals is consequently crucial, as they represent the most important link in the chain linking the latest scientific evidence and parents. In Italy this aspect is particularly important, as only 47.7% of parents put their children to sleep exclusively in the supine position (Campagna Genitori Più, 2009).

In terms of knowledge, 90% of physicians (including paediatricians, obstetricians and all other physicians) stated that the supine position represents a protective factor against SIDS, while in 2005 this percentage was 78% (Moon et al., 2007b). Such an increase was expected, because the 2005 data was gathered before the AAP recommended exclusively the supine position. If single specialties are considered, it is possible to notice the same increasing trend. The percentage of paediatricians believing the supine position to be the safest rose from 67% in 2002 (Moon et al., 2002) to 82% in 2007 (Moon et al., 2007b), and 97% in the present study. For non-paediatricians, instead, this percentage increased from 37% in 2002 (Moon et al., 2002) to 70% in 2007 (Moon et al., 2007b), and 85% in the present study. Additionally, if nurses are considered, it is possible to notice that while in 2004 44% believed the supine position alone to be the safest (Bullock et al., 2004), in the present survey the percentage of nurses believing that it has a protective effect against SIDS was found to be 88%. These results suggest that the AAP recommendation has been received by paediatricians and nurses, but also that it should be spread more effectively among the other healthcare professionals.

If we focus on the recommendations about the sleep position that professionals make, Italian healthcare professionals seem to lie behind their American colleagues. The percentage of physicians in the US that recommended exclusively the supine position was 69% in 2007 (Moon et al., 2007), while it is 62% in the present study of Italy, and the percentage of

American physicians recommending a non-prone position was 96% in 2007 (Bullock et al., 2004) and only 80% in the present study. Looking at different specialties, the percentage of physicians recommending exclusively the supine position in 2007 was 74% among paediatricians and 62% among general practitioners (Moon et al., 2007b), while in the present study it is respectively 70% and 56%. Among American nurses, moreover, in 2008 the recommendation of the exclusive supine position was given by 55% of respondents and that of any non-prone position by 98% (Price et al., 2008) (82% in 2004 - Bullock et al., 2004), while in the present study these percentages are 55% and 80% respectively.

Finally, considering the determinants of knowledge and recommendations, the results of the two models are fairly different. In the knowledge model, in fact, there is a gender component that leads to think that females tend to be more attentive and updated about this topic. However, the absence of this component from the recommendations model suggests that females did not modify yet their behaviour by recommending parents the supine position alone. Nevertheless, the absence of '*gender*' from the recommendations model could also be interpreted as a sign of healthcare professionals' scepticism towards the latest guidelines. Given the aforementioned uncertainty on the cause of SIDS, in fact, some professionals might consider their knowledge and experience in the field more relevant than the latest, and possibly not definitive, guidelines. The age component, instead, is present in the recommendations model but absent in the knowledge model, suggesting that the willingness of delivering the BTS message may be varying over time. However, the coefficients of the model may suggest a non-linear effect of the variable age which is not measurable with the available information (the variable age, in fact, was originally measured in classes and not as a continuous variable). All the other components of the two models coincide, even if it is clear that the influence of the professional role and of the macro-region is not as important when the recommendations are considered as it is when it comes to knowledge. Unfortunately, due to the lack of reliable data about SIDS prevalence in Italy, it was not possible to verify whether these differences in knowledge also corresponded to a different SIDS prevalence between macro-regions.

This study has some limitations. The first is the high percentage of non-responses to the question about the recommendations given to parents. The

second relates to the recruitment process that was used to get healthcare professionals involved in the campaign. For the first limitation, the use of multiple imputation may lead to a more complete dataset and so to a more precise analysis. As for the recruitment process, its weakness is given by the fact that it was voluntary from the beginning (the participation of a region) to the end (the participation of a healthcare professional to the training courses). As a result, the sample cannot be assumed to be representative of the Italian population of healthcare professionals as it provides information that is limited to the healthcare professionals belonging to the participating regions. Additionally, it could be argued on the one hand that the people who volunteered for the training were the most interested in learning new information on this topic, or those who most needed to learn; but on the other hand it could be argued that the most prepared healthcare professionals did not take part in the training because, given their high level of knowledge, they did not feel the need to do so. Unfortunately, due to the lack of a central database, it was not possible to assess any of the differences that may exist between participants and non-participants. In the future, efforts should be made to implement a survey with a recruitment process using a probability sample and trying to insure a more homogenous participation at least in the three macro-regions.

5.6. Conclusions

The results of this study are consistent with corresponding data from the US. The level of healthcare professionals' knowledge of the protective effect that the supine position has towards SIDS is satisfactory overall. This is especially true among paediatricians, who are the most important source of information for parents. Nurses also show an increase in their degree of knowledge in time. However, in terms of recommendations that are given to parents, much more needs to be done. Specific training targeting those healthcare professionals who showed to be giving wrong recommendations is to be encouraged in order to raise the percentage of professionals recommending exclusively the supine sleep position. As this initial effort is taking place, paediatricians should constitute the primary instrument of the healthcare system for delivering effectively the BTS message to parents.

6. What do healthcare professionals know about SIDS? The results of the Italian campaign GenitoriPiù

This chapter analyses the data resulting from the Italian campaign GenitoriPiù and focuses on the assessment of healthcare professionals' knowledge about SIDS.

By considering a polytomous response set to several items about SIDS risk factors, the chapter initially adapts a Rasch model to the data in order to obtain an index of unpreparedness which is analysed with a random effects logistic regression model. Then, to allow a deeper interpretation of the data, the chapter considers a dichotomous response set to obtain an index of preparation, and then uses two logistic quantile regressions to analyse both indices. This choice was made in order to understand which demographic and professional background factors influence healthcare professionals' knowledge of this topic at different levels of preparation and unpreparedness.

The results indicate that significant differences among regions are evident, and the effect of training initiatives is confirmed to be a successful way to rectify these differences. With regard to professional background, the best-prepared healthcare professionals are paediatricians and those professionals who work in birth centres and family planning clinics.

6.1. Introduction

In this chapter, we analyse the data resulting from the campaign GenitoriPiù. We focus on the assessment of healthcare professionals' knowledge about SIDS and its risk factors on the basis of their personal and contextual characteristics. If this is achieved effectively, in fact, we will be able to identify those in need of additional training and to transmit this information to policymakers. Moreover, since in Italy most of the healthcare policy decisions are made at a regional level, we also want to assess whether the regional effect is significant or not.

As mentioned in the previous chapters, at the moment the most effective way to reduce the risk of SIDS is through preventive action, and in Italy there is a special law about this topic which was enacted in 2006. This law provides for the promotion of awareness and prevention campaigns to ensure accurate information dissemination for SIDS, and for the development of guidelines. The training of healthcare professionals is also one of its objectives (2 February 2006, law n. 31, art. 4).

Nevertheless, despite the importance of healthcare professionals' role, in the literature there are not many studies that have investigated healthcare professionals' knowledge about SIDS and its risk factors (see Chapter 4). Moreover, the vast majority of these studies are significantly different from this. Most of them (20) were carried out in the USA, with only one study carried out in Turkey and three in Australia. Most of them involved less than 500 sample members, with only six studies involving more. Most of them targeted a single professional figure (usually paediatricians or nurses), with only six studies involving more. Most of them were carried out before 2005, which is the year of the latest recommendations for SIDS prevention of the AAP at the time when this survey was run (2009), with only four studies run after 2005. Most of them did not run any analysis of the determinants of knowledge, with only five studies doing this. Moreover, most previous studies focused on the answers given to one or more items rather than on an index that tried to summarise a range of items, indeed only one study attempted to elaborate an index. To summarise, it is very hard to find suitable terms of comparison in the literature for this study. A study with so many respondents, involving different professional figures, referring to the latest AAP recommendations, focusing on more than a single SIDS risk factor, and performing an analysis of the determinants of knowledge, has never been done before.

However, it is worthwhile to further investigate the findings that emerged in the previous studies that performed an analysis of the determinants of knowledge of some specific items connected with SIDS and its risk factors. Most of these studies referred just to correct knowledge about infants' positioning during sleep. With reference to this particular issue, the determinants of knowledge that were found to be associated with greater knowledge were: being a paediatrician (rather than serving in another professional role), being a female, being white (non-Hispanic), being more educated, working in urban settings, and not having a majority of black

children to care for (Eron et al., 2011; Moon et al., 2008; Moon et al., 2007b; Moon et al., 2002). It is not possible to draw a clear conclusion on the effect of years of professional experience, as in one study this factor was found to increase knowledge and in another one it was found to decrease it (Moon et al., 2008; Bullock et al., 2004).

In four of the aforementioned studies the researchers investigated the effectiveness of focused training on healthcare professionals' knowledge. In all four cases, undertaking such training significantly increased healthcare professionals' preparation, both in the short run and in the long run (Shaefer et al., 2010; Moon et al., 2008; Moon and Oden, 2003; Young and O'Rourke, 2003).

6.1.1. Aims of the present work

The aim of this chapter is to analyse healthcare professionals' knowledge about SIDS and its risk factors on the basis of their demographic and professional background. The healthcare professionals who are better prepared are those who can be entrusted with the task of educating the parents of newborn infants, while additional training sessions should be created for healthcare professionals who are not as well prepared.

We want to verify if there is a regional effect, because the region is the level at which healthcare decisions are made politically in Italy. Moreover, we are interested in professional characteristics (such as professional role and workplace) that can be used to devise targeted training initiatives. Our objectives were attained via two steps: (1) construction of synthetic indices of knowledge of healthcare professionals, and (2) analysis of these indices as functions of a set of explanatory variables that identify different types of healthcare professionals.

6.2. Data

The GenitoriPiù campaign and its survey involving healthcare professionals were described in Section 5.1 (page 62) and Section 5.2 (page 63). In this chapter we focus on the items that asked healthcare professionals to indicate the effect of the following factors with respect to the degree of protection they provided against SIDS (respondents could choose between '*protects*', '*does not protect*', and '*I do not know*', and the correct answer is here given in brackets):

- Put the newborn to sleep in a supine position [protects];
- Avoid smoking in the room where the newborn sleeps [protects];
- Use a soft mattress for the crib of the newborn [does not protect];
- Breastfeeding [protects];
- Keep high the temperature of the room where the newborn sleeps [does not protect];
- Ensure that newborns touch the bottom of the cot with their feet [protects].

In addition, an item concerning the usefulness of electrocardiogram (ECG) screening for the prevention of SIDS was also included in the section about SIDS, and, as a consequence, it was considered in the analysis (with '*does not protect*' as a correct answer). Given the current scientific evidence this intervention does not appear to be proven useful in the prevention of SIDS. However, the selection of items was performed by the Italian policymakers and corresponded to the instructions that healthcare professionals were given during the training sessions. The discussion about the items to be included in the survey was held when the campaign was set up, and before the survey was conducted, and we had no control over this. As a consequence, it was not possible to influence this selection, regardless of the fact that some items were still debated within the scientific community. However, it is comforting that the results of this analysis showed that this item is not as discriminating as all the other items.

6.3. Methods

6.3.1. Preliminary analysis

Descriptive analysis of the data showed that the response category '*I do not know*' was chosen frequently: in the case of '*use of a soft mattress*', for example, it accounted for 19.6% of the answers, and this figure rose to 25.2% in the case of '*touching with the feet the bottom of the cot*' and 25.4% in the case of '*perform an ECG*'. Starting from this evidence, we assumed that the response variable was of ordinal nature (with correct being the best response, '*I do not know*' being the second-worst response, and wrong being the worst response). The hypothesis underlying this assumption is that the response '*I do not know*' should be interpreted as a less serious admission of ignorance than a wrong answer. Giving parents wrong advice, in fact, will have much

worse consequences than admitting not knowing the correct answer and telling them to come back or to seek further advice. Moreover, it seems reasonable to imagine that is easier to train those who do not believe they know the answer, than those who have incorrect beliefs.

The analysis began by constructing an index quantifying healthcare professionals' unpreparedness. This index of unpreparedness (IU) was constructed through a Rasch model (Fisher, 1995; Wright and Masters, 1982; Wright, 1977; Rasch, 1960), a privileged tool of the Item Response Theory (IRT) (Baker and Kim, 2004; Hambleton and Swaminthan, 1985). Since the number of possible response categories was constant for all items, the formulation of the Rasch model that has been used is the two-parameter Rasch model for ordinal responses (also known as the Rating Scale Model (RSM) - Andrich, 1978; Wright and Masters, 1982):

$$\Pr(X_{in} = w | \theta_n) = \frac{\exp\{\lambda_i \sum_{l=0}^w (\theta_n - \delta_{il})\}}{\sum_{w=0}^W \exp\{\lambda_i \sum_{l=0}^w (\theta_n - \delta_{il})\}} \quad (6.1)$$

where:

$X_{in} = 0, \dots, w, \dots, W$ is the variable that describes the answer given by the n -th respondent to the i -th item;

W indicates the number of the possible response categories, here constant for all the I items;

θ_n indicates the preparation (here the unpreparedness) of the n -th respondent: the greater this parameter, the greater the probability that the respondent would choose the highest-order response category (to build the IU the highest score was assigned to the wrong answer, and the lowest score to the correct one);

δ_{il} indicates the difficulty parameter associated with the transition from the category $(l-1)$ to the category l for the i -th item. The greater this parameter, the greater the probability that the respondent would stop at the $(l-1)$ th category. The estimate of δ_{il} represents the value at which an individual with an ability parameter θ_n equal to δ_{il} will have a probability of going over the l -th threshold for the i -th item of 0.5. The higher the difference between θ_n and δ_{il} , the higher the probability that the respondent will go over the threshold. This relationship makes it possible to compare the preparation of a respondent with

the difficulty of an item in order to predict the probability of choosing a certain response category;

λ_i indicates the discrimination parameter for the i -th item. The parameter λ_1 , the one referring to the first item, is set equal to 1 because of identification; as a consequence, the first item acts as the item of reference for all the other items. The degree to which λ_i is greater than 1 indicates the stronger discrimination power of the i -th item with respect to the item of reference, while the degree to which λ_i is less than 1 indicates the weaker degree of discrimination power of the i -th item with respect to the item of reference. An item with λ_i greater than 1, then, will be better in distinguishing between more and less prepared respondents than the reference item. An item with λ_i less than 1, instead, will be less effective in distinguishing between more and less prepared respondents.

The model is defined as a '*two-parameter model*' because, conventionally, this number is related to the number of parameters that refer to each item. The original Rasch model does not consider the discrimination parameter (λ_i); however, this parameter deserves to be taken into account in this analysis because it seems reasonable for the seven items to possess different discrimination power. To see if this is the case we analyse the Category Probability Curves (CPC) for each item. The curves are plotted so that their sum at each point of the graph is constant and equal to 1. The choice to include in the model the parameter λ_i is justified if the graphs of the two models (with and without λ_i) differ greatly.

The correct application of the Rasch model is constrained to the fundamental assumption of one-dimensionality; that is, to the assumption that the I items being used are all indicators of the latent variable of interest: the unpreparedness. With this goal in mind, we assessed the one-dimensionality of the model *a priori*, and, given the nature of the response variable, we proceeded with a correspondence analysis. Its results showed a very high proportion of inertia explained by the first dimension (77.2%), which was characterised by coordinates of the same sign for all items in correspondence of the same categories. Moreover, the first axis clearly separated correct answers from incorrect ones, with an intermediate position for '*I do not know*'.

Finally, we deemed appropriate to validate the discrimination parameters obtained with the Rasch model with reference to the opinion of some experts,

in order to ensure that the estimates of the discrimination parameters based on the healthcare professionals' answers were not systematically biased. To this end, five generally recognised national experts were asked to fill in a short questionnaire. In the questionnaire, each expert had to assign each of the seven items included in the survey a weight that accounted for the importance of possessing the right knowledge of the topic to which the item referred. To insure the comparability between the different weights, the total of the assigned weights was constrained to be 100. The importance of the weights was therefore estimated by averaging the experts' judgments for each item. The concordance of the results was then assessed through the use of the Spearman's rank correlation coefficient between λ_i and experts' weights. The Spearman's coefficient was equal to 0.8929 ($p=0.007$).

Once the index was ready, we considered it as a dependent variable.

The approach we used is the random intercept logistic model (Goldstein, 1999; Goldstein and Healy, 1994). We were mainly interested in the regional effect, because the region is responsible for the most important healthcare policies. Thus we considered the Region as a fixed effect. Anyway, because regional directions are applied at the Local Health Authority (ASL) level, the ASL was considered as a random effect, in order to assess if the additional administrative partition in ASLs led to different behaviours within the same region. The effect of the ASL, then, was estimated using the intraclass correlation coefficient (ICC).

The choice of a logistic model is justified by the strong non-normality of the response variable, which led us to the decision to dichotomize the index's scores. The threshold for the dichotomisation of the dependent variables was carefully discussed together with the policymakers involved in the campaign. The results of this brainstorming were as follows: when the healthcare professionals' unpreparedness is considered, the threshold should have been such that approximately 20% of the healthcare professionals were considered '*weakly prepared*'. The request that the policymakers made, in fact, was that the threshold for '*weakly prepared*' ideally included those healthcare professionals who did not answer the questions regarding sleeping position, the avoidance of smoking, or the appropriate temperature of the room correctly. This percentage, precisely, was 19.8%. Once the threshold considered significant by the policymakers was obtained, a sensitivity analysis was performed to ensure the consistency of the results. The threshold was

moved by a few percentage points many times in order to identify the intervals at which the results changed significantly. The new threshold, then, was established at 26.1% (with a consistency interval between 19.4% and 38.5%).

6.3.2. Construction of two synthetic indices of knowledge

When we presented the results of the preliminary analysis to the policymakers, though, we realised that, besides being interested in knowing who were the least prepared healthcare professionals, they were also interested in knowing who the most knowledgeable ones were. In this way, in fact, they would have known who the most reliable healthcare professionals were when there was the need to talk with parents about these issues. Moreover, they wanted to know if the effect of the explanatory variables changed if we considered extreme values of the index of knowledge.

To comply with the expectations of the policymakers, then, we decided to build a second index of knowledge, this time considering preparation about SIDS risk factors. Therefore, we constructed two synthetic indices:

- The *index of unpreparedness* (IU), built maintaining the original response categories and assuming that the response variable is ordinal;
- The *index of preparation* (IP), built considering two different response categories: correct and incorrect (which consisted of wrong + the answer '*I do not know*').

These two aspects do not complement each other, as among the response categories there is also the answer '*I do not know*', which is a form of unpreparedness although it is less serious than the wrong answer. In fact, it is preferable to at least '*know what you do not know*' to having incorrect knowledge.

For the construction of the IP, the model in Equation 6.1 is reduced to a two-parameter Rasch model for dichotomous responses (Birnbaum, 1968). To evaluate the appropriateness of including the discrimination parameter in the model, we looked again at a graphical representation. As we were now considering dichotomous responses, we had to look at the Item Characteristic Curves (ICC²), which are parallel to each other when the discrimination parameter is not included. However, if the inclusion of the discrimination parameter is needed, there should be a loss of this parallelism.

Once again, we assessed the one-dimensionality of the model *a priori* with a correspondence analysis. In this case, the proportion of inertia explained by

the first dimension was of 81.2%. We also validated the discrimination parameters obtained with the Rasch model for the IP with the opinion of the experts. In this case, the Spearman's coefficient was equal to 0.8571 ($p=0.014$).

6.3.3. Analysis of the indices of knowledge

In order to determine which environmental and individual factors significantly affected healthcare professionals' knowledge, and to comply with the expectations of the policymakers about eventual different effects of the explanatory variables at the extreme values of the indices, we modelled the indices with the quantile regression (Koenker, 2005). This choice is justified for several reasons. First of all, it allows us to analyse the determinants of preparation and unpreparedness at the extreme values of the indices. Moreover, it makes it possible to model variables of interest which are not normally distributed and which, at the same time, describe bounded outcomes (and this is the case, as there are a minimum and a maximum in the two indices). As a result, there is no longer a need to dichotomize the indices' scores, thus eliminating any possible subjectivity in the establishment of the thresholds for the dichotomisation.

The '*classic*' quantile regression model is:

$$y_i = \mathbf{x}_i' \boldsymbol{\beta}_p + \varepsilon_i \quad (6.2)$$

where:

y_i indicates the continuous outcome for the i -th respondent;

$\mathbf{x}_i' = \{x_{i1}, \dots, x_{is}\}$ indicates the values of a set of S covariates for the i -th respondent;

$\boldsymbol{\beta}_p = \{\beta_{p0}, \beta_{p1}, \dots, \beta_{ps}\}$ indicates the $(S+1)$ regression parameters for the p -th quantile.

As a consequence, the p -th quantile is given by:

$$p = P(y_i \leq \mathbf{x}_i' \boldsymbol{\beta}_p | \mathbf{x}_i) \quad (6.3)$$

And the p -th quantile of the conditional distribution of y_i given \mathbf{x}_i is:

$$Q_y(p) = \mathbf{x}_i' \boldsymbol{\beta}_p \quad (6.4)$$

The quantile regression can be applied to the data regardless of the distribution of the variables of interest, thus making unnecessary any

hypothesis about the. We considered two variables of interest: the IU and the IP. However, rather than using dependent variables with bounds that could vary depending on the data, we preferred to adopt dependent variables varying between 0 and 1, a choice which would ease the interpretation of its values and of the results. As a consequence, the dependent variables were standardised. To analyse them, we used the quantile regression for bounded outcomes, specifically the logistic quantile regression (Bottai et al., 2010). To implement it, Bottai and colleagues used a property of the quantile regression, the equivariance to monotonic transformations of the outcome, that is:

$$Q_{h(y)}(p) = h\{Q_y(p)\} \quad (6.5)$$

where:

h is a known nondecreasing function from the interval (y_{min}, y_{max}) to the real line.

In (5), h is the link function, so that:

$$h\{Q_y(p)\} = \mathbf{x}'_i \boldsymbol{\beta}_p \quad (6.6)$$

The logistic transformation is defined by (Bottai et al., 2010):

$$h(y_i) = \text{logit}(y_i) = \log\left(\frac{y_i - y_{min}}{y_{max} - y_i}\right) \quad (6.7)$$

And the inverse transformation is:

$$Q_y(p) = \frac{\exp(\beta_{p,0} + \beta_{p,1}x_1 + \dots + \beta_{p,S}x_S)y_{max} + y_{min}}{\exp(\beta_{p,0} + \beta_{p,1}x_1 + \dots + \beta_{p,S}x_S) + 1} \quad (6.8)$$

Finally, the regression coefficients can be estimated using the quantile regression on the transformed outcome $h(y)$:

$$Q_{h(y_i)}(p) = \mathbf{x}'_i \boldsymbol{\beta}_p \quad (6.9)$$

We considered the set of the aforementioned explanatory variables and performed simultaneous logistic quantile regression for the median and the 75th percentile. The standard errors of the coefficients were estimated by bootstrapping with 1,000 replications, which outperform asymptotic standard errors (Orsini and Bottai, 2011). Confidence intervals (CI) were also computed and hence, relating to the same explanatory variable, we were able to compare the regression coefficients corresponding to different quantiles.

The data analysis was performed with the statistical software Stata (StataCorp, 2011). In particular, we adapted the Rasch models using the

`gllamm` command (Zheng and Rabe-Hesketh, 2007; Rabe-Hesketh et al., 2004). The logistic quantile regressions, instead, were performed using the `lqreg` command (Orsini and Bottai, 2011). It is worthy pointing out that it was not possible to use any bootstrapping in order to accounts for the extra uncertainty in the fitting of the Rasch models. The reason behind this impossibility derives from computational issues, and, in particular, from the time taken by the software in order to run the `gllamm` command.

6.4. Results

6.4.1. Overview of the knowledge level of healthcare professionals

The distribution of the healthcare professionals' answers shows results that vary considerably among the items (Table 6.1). To take one example, the percentage of correct answers referring to the item '*avoid smoking*' is over 90%, while it is just over 30% for the item '*touching with the feet the bottom of the cot*'.

Table 6.1. Distribution of answers given by the respondents to the 7 items

Which of the following factors protect newborn infants from SIDS?	Correct answers	Wrong answers	I do not know	Non-response
Avoid smoking where the newborn sleeps	90.8%	4.2%	2.2%	2.8%
Put the newborn to sleep in a supine position	88.0%	7.4%	2.4%	2.2%
Keeping the temperature of the room high	86.3%	4.1%	6.1%	3.6%
Breastfeeding	76.7%	10.5%	8.4%	4.4%
Using a soft mattress for the cot	65.4%	9.0%	19.6%	6.0%
Performing an ECG examination of the newborn	47.1%	22.1%	25.4%	5.4%
Ensure that the newborn's feet touch the cot's bottom	33.2%	37.7%	25.2%	3.9%

Source: GenitoriPiù national campaign, healthcare professionals' survey.

The proportion of incorrect answers is sometimes considerable, confirming the need for additional training of healthcare professionals. Finally, it is possible to note how the wrong answers and the '*I do not know*' answers have similar distributions. This fact supports the decision to analyse the three response categories separately.

Heterogeneity in knowledge is observed even with respect to the respondents' background, and in particular if professional role is considered (Table 6.2). Paediatricians and obstetricians provide an average of 5.4 and 5.2 correct answers out of 7, respectively, while physicians and other professionals (social professionals, educators, hygienists, etc.) provide an average of 4.4 and 4.3. There is also a clear inverse relationship between average and variability: as the average number of correct answers declines, the variability increases. Most likely, when viewed from the perspective of professional roles, the least prepared roles are those in which there was little focus in the past on SIDS. Therefore, since less standardisation of knowledge exists in these roles in which there is no general focus on SIDS, awareness and level of knowledge of SIDS will depend on the specific experience and training of individuals.

Table 6.2. Average number of correct answers by professional role

Professional role	Paedia- trician	Obste- trician	Health. assistant	Nurse	Physician	Other
Average number of correct answers	5.40	5.19	4.84	4.82	4.39	4.31
Standard deviation	1.18	1.30	1.51	1.43	1.54	1.53

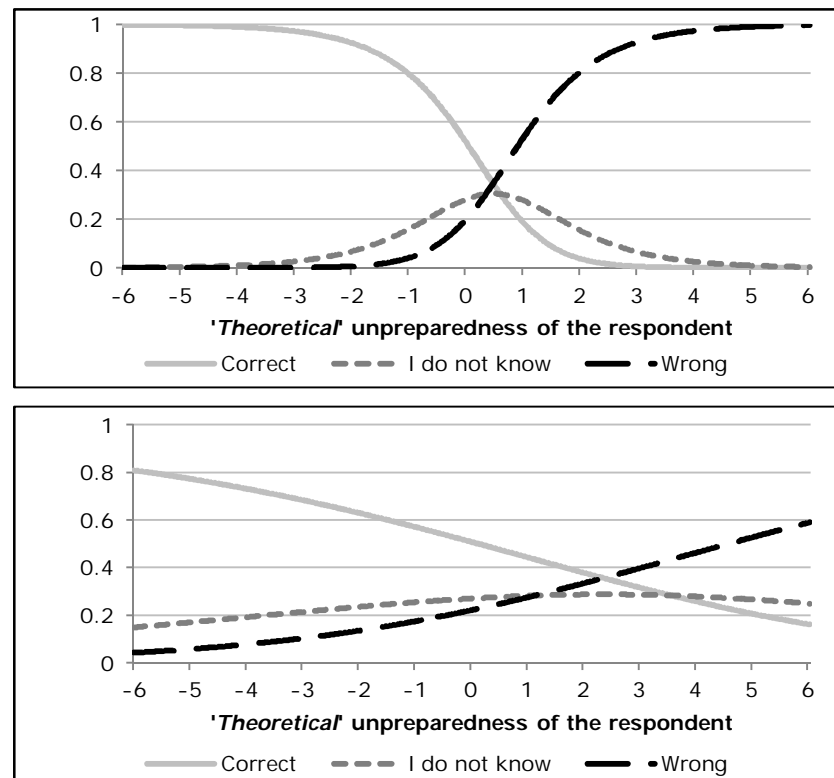
Source: GenitoriPiù national campaign, healthcare professionals' survey.

6.4.2. Preliminary analysis

The first step of the analysis was to evaluate the opportunity of including the discrimination parameter λ_i in the Rating Scale Model for the IU. We estimated six discrimination parameters, one for each item, with '*sleeping supine*' chosen as reference ($\lambda=1$) because it is the most important protective factor against SIDS and, consequently, it should be among those with the highest discrimination power.

Both the graphic analysis of the models with and without the discrimination parameter (Figure 6.1) and the likelihood ratio test (D-test statistic=224.6, $p < 0.001$) suggest the inclusion of a discrimination parameter.

Figure 6.1. Ordinal response (correct, 'I do not know', wrong) model. Probability functions for three possible responses in reference to the item 'perform an ECG': model without (top) and with (down) discrimination parameter λ_i



Note: the '*theoretical*' unpreparedness in the graphs is represented by the values that have been used in order to draw the CPCs.

Source: GenitoriPiù national campaign, healthcare professionals' survey.

As mentioned in the Methods, when we consider an ordinal response model, it is necessary to analyse the CPC for each single item. By analysing, for example, the graphs that refer to the item '*perform an ECG*' (Figure 6.1), it is possible to notice how these two graphs (with and without the discrimination parameter) are considerably different: the latter has a much more '*stretched*' shape, which corresponds to a low discrimination power. This means that very unprepared respondents have a higher probability of answering correctly to this item than in the case of the reference item.

Table 6.3 shows the estimates and the significance levels of the discrimination parameters for the ordinal response model. The item '*sleeping*

supine' was chosen as the reference item because it has been the most known protective factor against SIDS for many years. For this reason, it should be among those with the highest discrimination power (respondents that give the wrong answer to this item will be more likely to give wrong answers to the others as well).

Table 6.3. Ordinal response (correct, '*I do not know*', wrong) model[†]. Estimates of discriminatory parameters (λ_i), standard errors, Wald test values (WTV) and their significance

Which of the following factors protect newborn infants from SIDS?	λ_i	Std. error	WTV	Significance
Avoid smoking where the newborn sleeps	3.37	1.392	1.70	0.089
Put the newborn to sleep in a supine position	1 (<i>ref.</i>)			
Breastfeeding	0.86	0.101	-1.38	0.168
Keeping the temperature of the room high	0.54	0.084	-5.48	<0.001
Ensure that the newborn's feet touch the cot's bottom	0.51	0.061	-8.01	<0.001
Using a soft mattress for the cot	0.32	0.056	-12.15	<0.001
Performing an ECG examination of the newborn	0.18	0.040	-20.47	<0.001

[†] The response variable has three categories (correct, wrong, and '*I do not know*').

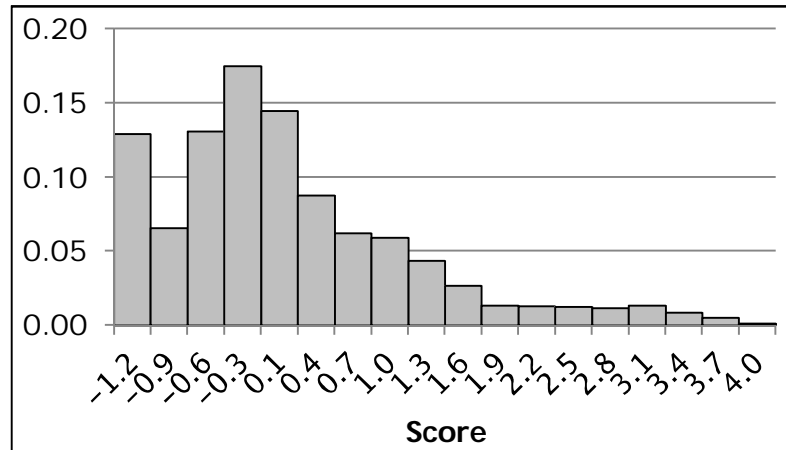
Source: GenitoriPiù national campaign, healthcare professionals' survey.

The table reveals that the λ_i for the items '*avoid smoking*' and '*breastfeeding*' were not significantly different from '*sleeping supine*' ($p=0.089$ and $p=0.168$ respectively). This means that answering the question incorrectly for any one of these items implies a higher probability of also answering the other questions incorrectly; overall, this would very likely imply a generally high unpreparedness on the part of the respondent. The other items have a significantly lower discrimination power ($p<0.001$); the lowest power is associated with '*perform an ECG*' ($\lambda=0.18$). This means that giving the wrong answer to this item does not imply that the respondent gave the wrong answer to all the other questions too.

The distribution of the IU, once it is standardised between 0 and 1, is clearly skewed (Figure 6.2) and does not follow a normal distribution (see also

Table 6.6). The dichotomization of the IU took place as was explained earlier in the chapter.

Figure 6.2. Density of the IU (standardised)



Source: GenitoriPiù national campaign, healthcare professionals' survey.

After obtaining the appropriate IU, we proceeded with the random intercept logistic regression (Table 6.4). The ICC of the model was equal to 0.04, which is very low, almost negligible. Only 8 ASLs (out of 59) showed a baseline value that was significantly different from the mean. Hence, the results below refer to a one-level logistic model in which the effect of ASL is omitted.

The generalized R^2 is 9.2%, a fairly good value with only five variables. Professional seniority was dropped from the model during the analysis because of its correlation with age (Spearman's $\rho=0.572$). Age, instead, was left in the model despite its lack of significance because it could represent a useful hint for targeted training sessions.

The effect of the professional role is very important. Once the paediatrician is taken as a reference, all the other professional roles show significantly higher levels of unpreparedness, with the only exceptions being the '*male obstetrician*' (possibly because we have too few cases and a high standard error). The obstetrician is the professional role with the best knowledge after the paediatricians. The level of knowledge of other physicians is much worse than that of paediatricians. However, it is worthy to remember that they are mostly gynaecologists, and that their major role next to newborns' parents ends at the time of childbirth. Nonetheless, this result underlines how they may be at risk of an excessive specialization in terms of their knowledge on this topic.

Table 6.4. Logistic regression of the Index of Unpreparedness: estimates of odds ratios and their confidence intervals

Covariate	Odds Ratio [OR]	95% Wald Confidence Interval	
Age: ref. 55 years and older			
18-34 years	1.282	0.957	1.719
35-44 years	1.147	0.905	1.452
45-54 years	1.061	0.860	1.309
Prof. role among males: ref. Paediatrician			
Healthcare assistant	4.444	1.607	12.291
Nurse	4.070	1.978	8.375
Obstetrician	4.524	0.860	23.812
Physician	3.881	2.424	6.212
Other	3.571	2.002	6.366
Prof. role among females: ref. Paediatrician			
Healthcare assistant	1.996	1.393	2.860
Nurse	1.790	1.310	2.445
Obstetrician	1.469	1.031	2.094
Physician	2.352	1.591	3.477
Other	2.380	1.661	3.409
Workplace: ref. Birth centre			
Dep. of public health	1.571	1.180	2.092
District	1.865	1.460	2.383
Family planning clinic	1.114	0.858	1.447
Hospital	1.694	1.290	2.225
Medical clinic	1.739	1.269	2.383
Vaccinations centre	2.121	1.533	2.935
Other	1.819	1.235	2.679
Region: ref. Veneto			
Abruzzo	0.490	0.135	1.772
Aosta Valley	2.300	1.351	3.916
Apulia	2.072	1.602	2.680
Emilia-Romagna	0.983	0.745	1.297
Friuli Venezia-Giulia	0.529	0.386	0.725
Lazio	2.034	1.592	2.599
Lombardy (2 Milan ASLs)	1.394	1.002	1.940
Molise	1.131	0.482	2.656
Sardinia	1.653	1.278	2.139
Umbria	1.224	0.920	1.628

Source: GenitoriPiù national campaign, healthcare professionals' survey.

Among females the difference of knowledge between paediatricians and the other professional roles is not as high as it is among males.

The workplace also has an effect on healthcare professionals' knowledge: taking the birth centre as a reference, all other workplaces show an IU which is significantly higher, with the only exception of the family planning clinics.

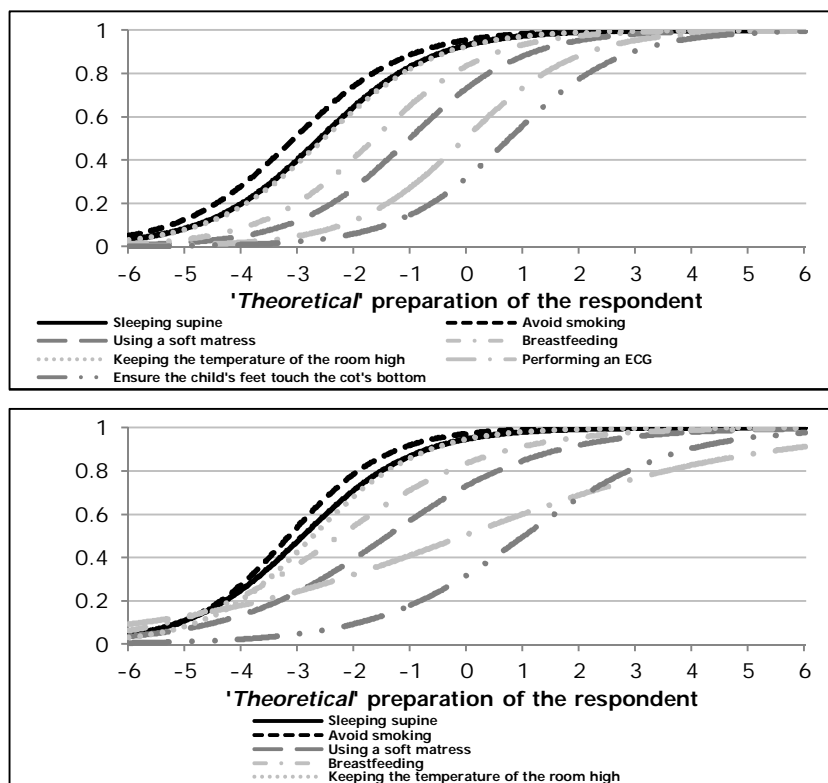
Finally, it is possible to spot many regions that behave differently from Veneto: Friuli-Venezia Giulia, with a significantly higher degree of knowledge, and Lazio, Lombardy, Apulia, Sardinia and Aosta Valley with a significantly worse performance. The result on the Friuli-Venezia Giulia is of particular interest, as in this region the local policymakers implemented training courses on this topic which have been running for some years before this survey.

6.4.3. The inclusion of the IP

As we included in the analysis also the IP, we had to verify that the decision to consider the discrimination parameter for the Rasch model was justified also in this case. Once again, both the graphic analysis of the models with and without the discrimination parameter (Figure 6.3) and the likelihood ratio test (D-test statistic=154.3, $p<0.001$) suggest the inclusion of a discrimination parameter.

As mentioned in the Methods section, in the case of a dichotomous set of responses the graphical analysis needs to focus on a lack of parallelism in the ICCs² of the model that includes the discrimination parameter. In Figure 6.3 we can see a big change in the slopes of the ICCs² when we do not assume the λ_i to be constant for all the items, thus confirming that the inclusion of a discrimination parameter is important. In particular, the item '*avoid smoking*' has a much higher discrimination power than does the item '*perform an ECG*'. In fact, a small change in the preparation score (θ) corresponds to a large variation in the probability of answering the question regarding smoking correctly, while the variation is not large in the probability of a correct response to the questions concerning performing an ECG examination.

Figure 6.3. Dichotomous response (correct/incorrect) model. Item Characteristic Curves (ICCs²) without (top) and with (down) discrimination parameter λ_i



Note: the '*theoretical*' preparation in the graphs is represented by the values that have been used in order to draw the ICCs².

Source: GenitoriPiù national campaign, healthcare professionals' survey.

Table 6.5 shows the estimates and the significance levels of the discrimination parameters for the dichotomous model. The table reveals that the highest discrimination power is assigned to '*sleeping supine*' (the reference item), '*avoid smoking*' and '*keeping the temperature of the room high*' (*ps* equal to 0.223 and 0.630 respectively), while the other items have a lower discrimination power.

Moreover, in Table 6.5 we can see how the discrimination parameters that may be assumed equal to 1 are not the same as those found in Table 6.3. This shows that the role played by each item is different if we consider preparation or unpreparedness. Additionally, the variation interval of the parameter estimates in Table 6.3 is considerably greater than the interval that was found in Table 6.5 (0.18 to 3.37 vs. 0.39 to 1.14). In other words, if unpreparedness is considered the discrimination power of the items is higher. Therefore, assessing the preparation of the healthcare professionals is less efficient if the categories '*I do not know*' and '*wrong answer*' are treated as a single category.

Table 6.5. Dichotomous response (correct/incorrect) model[†]. Estimates of discriminatory parameters (λ_i), standard errors, Wald test values (WTV) and their significance

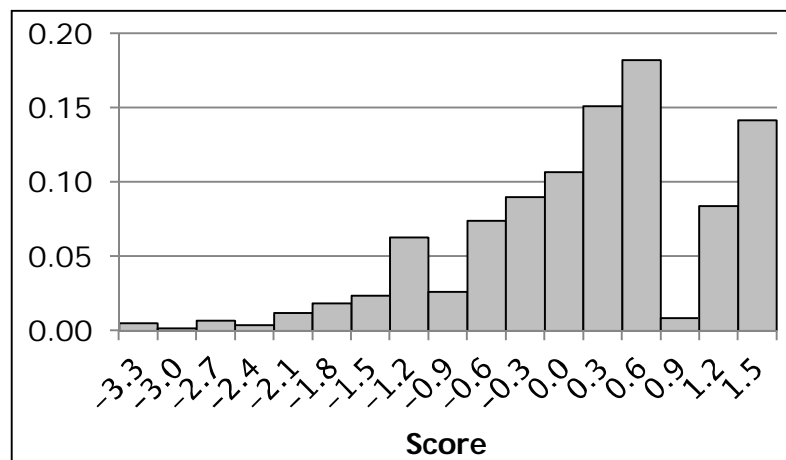
Which of the following factors protect newborn infants from SIDS?	λ_i	Std. error	WTV	Significance
Avoid smoking where the newborn sleeps	1.14	0.114	1.22	0.223
Put the newborn to sleep in a supine position	1 (<i>ref.</i>)			
Keeping the temperature of the room high	1.06	0.133	0.48	0.630
Ensure that the newborn's feet touch the cot's bottom	0.75	0.075	-3.29	0.001
Breastfeeding	0.72	0.074	-3.73	<0.001
Using a soft mattress for the cot	0.72	0.084	-3.35	0.001
Performing an ECG examination of the newborn	0.39	0.046	-13.23	<0.001

[†] The response variable is correct vs. (wrong + 'I do not know').

Source: GenitoriPiù national campaign, healthcare professionals' survey.

6.4.4. Identification of the most-prepared and least-prepared healthcare professionals in the knowledge of SIDS

As in the case of the IU, once it is standardised between 0 and 1 the distribution of the IP is also clearly skewed (Figure 6.4) and does not follow a normal distribution (see Table 6.6).

Figure 6.4. Density of the IP (standardised)

Source: GenitoriPiù national campaign, healthcare professionals' survey.

Table 6.6. Descriptive statistics of the IP and IU

Index	Mean	Std. dev.	First quartile	Median	Third quartile	Kolmogorov-Smirnov normality test
Preparation	0.713	0.202	0.595	0.736	0.826	$p < 0.005$
Unpreparedness	0.227	0.197	0.088	0.180	0.315	$p < 0.005$

Source: GenitoriPiù national campaign, healthcare professionals' survey.

To deal with this lack of normality, we applied to each index a simultaneous logistic quantile regression in order to investigate the effect of the respondents' professional and demographic background on the median and on the 75th percentile (Table 6.7). The professional and demographic background was described through the variables mentioned in Chapter 5. As it happened already in the preliminary analysis, however, years of professional experience was soon dropped during the analysis due to its correlation with age ($p=0.572$). The model also considers the interaction between gender and professional role; this choice is basically *a priori*, due to the different distribution of professional roles between males and females (females are significantly more likely than males to be obstetricians, and, among nurses, more females specialise in newborn care).

A younger age affects both the IP and the IU. For the youngest respondents (less than 35 years) the 50th percentile of the IP's logit is estimated to decrease by 0.352 if compared with the oldest professionals ($p < 0.001$). This effect is lower, but still significant, for professionals aged 35-44 ($\beta_{50} = -0.127$, $p=0.050$), and, finally, not significant for professionals aged 45-54. Therefore, it seems that the degree of healthcare professionals' preparation on this topic is decreasing over time. However, if we consider the 75th percentile, the estimates of the effect of age are never significant and they significantly differ from those of the 50th percentile. This fact implies that among the more prepared professionals there are no differences depending on age, but also that the median preparation decreases for the younger respondents.

Healthcare professionals aged less than 35 years also show a higher degree of unpreparedness, both in terms of median ($\beta_{50} = 0.203$, $p=0.002$) and of 75th percentile ($\beta_{75} = 0.318$, $p < 0.001$). Professionals aged 35-44, instead, present a group of more unprepared professionals whose unpreparedness is

Table 6.7. Simultaneous logistic quantile regressions for 50th and 75th percentiles of the IP and IU: estimated coefficients and significance of the comparison between the estimates of the 50th and 75th percentiles

Covariate	Index of preparation (IP)			Index of unpreparedness (IU)		
	50th percentile	75th percentile	50th vs. 75th	50th percentile	75th percentile	50th vs. 75th
<i>Intercept</i>	1.457***	1.580***		-1.871***	-1.499***	
<i>Gender: Female</i>	-0.038	0.000		-0.083	-0.093	
<i>Age: ref. 55 years and older</i>						
18-34 years	-0.352***	-0.222	***	0.203**	0.318***	
35-44 years	-0.127*	-0.001	*	0.072	0.236**	
45-54 years	-0.105	-0.001	*	0.002	0.084	
<i>Prof. role: ref. Paediatrician</i>						
Healthcare assistant	-0.781*	-0.301		0.816	1.000*	
Nurse	-0.435	-0.498**		0.655*	0.820*	
Obstetrician	-0.750***	-0.836		0.768	1.050	
Physician	-0.700***	-0.499***		0.765***	0.741***	
Other	-0.677***	-0.300		0.791***	0.864***	
<i>Interaction gender*prof. role</i>						
Female*Healthcare assistant	0.481	0.266		-0.527	-0.585	
Female*Nurse	0.240	0.463**		-0.357	-0.492	
Female*Obstetrician	0.588**	0.811		-0.601	-0.818	
Female*Physician	0.314*	0.454***		-0.353*	-0.198	
Female*Other	0.245	0.047		-0.312*	-0.384*	
<i>Workplace: ref. Birth centre</i>						
Department of public health	-0.185**	0.000	**	0.070	0.313***	***
District	-0.199*	-0.036		0.177*	0.441***	**
Family planning clinic	0.010	0.011		-0.018	0.000	
Hospital	-0.127	-0.011		0.139*	0.308**	
Medical clinic	-0.266***	-0.035	**	0.205**	0.298***	
Vaccinations centre	-0.177*	-0.036		0.169**	0.246**	
Other	-0.324**	-0.254		0.130	0.253*	
<i>Region: ref. Veneto</i>						
Abruzzo	0.075	0.241		-0.072	-0.352*	
Aosta Valley	-0.244	-0.121		0.383*	0.452**	
Apulia	-0.249***	-0.054	*	0.298***	0.559***	
Calabria	0.186	0.471		-0.248	-0.367	
Emilia-Romagna	-0.022	0.000		0.081	-0.010	
Friuli Venezia Giulia	0.113	0.011		-0.235*	-0.308***	
Lazio	-0.410***	-0.318***		0.370***	0.477***	
Lombardy	-0.105	-0.012		0.221**	0.227	
Molise	0.102	-0.036		0.091	-0.090	
Sardinia	-0.299***	-0.263***		0.284***	0.281**	
Umbria	-0.058	0.011		-0.177	0.079	

* p -value between 0.01 and 0.05, ** p -value between 0.001 and 0.01 and *** p -value less than 0.001.

Source: GenitoriPiù national campaign, healthcare professionals' survey.

significantly higher than that of the oldest professionals ($\beta_{IU_{75}}=0.236$, $p=0.002$), but they do not present any difference in the median.

Both preparation and unpreparedness differ significantly among workplaces. The more prepared and less unprepared respondents work in birth centres and in family planning clinics, whereas in all other workplaces preparation is significantly lower and/or unpreparedness is significantly higher. These results are worrying, because the newborn leaves the birth centre a few days after birth, and follow-up medical care usually takes place in other locations (medical clinics and vaccination centres).

In particular, the more-prepared birth centres' professionals do not significantly differ from the more-prepared professionals of all the other workplaces, but only those working in hospitals also show the same degree of median preparation. All the others, instead, show significantly lower median preparation, especially in the case of those working in medical clinics ($\beta_{IP_{50}}=-0.266$; $p=0.001$).

Moreover, if we consider the estimates of the 75th percentile of the IU's logit, an even bigger difference emerges and, in workplaces such as medical clinics, vaccination centres, districts and hospitals, it also persists when the median is considered. In these last workplaces, then, there are even more professionals with a significantly higher unpreparedness than exist in all the other considered workplaces.

The professional role is also a crucial determinant of the level of preparation and unpreparedness. However, in this case the degrees of knowledge are different depending on the gender of the healthcare professionals.

At high degrees of preparation (75th percentile), females in any professional role do not present a different degree of preparation than paediatricians. In fact, if we sum the estimated coefficients of the professional role and those of the interaction between gender and role, the total never significantly differs from zero (tests not shown but available on request). With regard to males, even the better prepared physicians and nurses are not as prepared as the paediatricians are.

When we consider the median, however, the differences in preparation also manifest amongst women: in this case, obstetricians are the only group for whom the sum of the estimated coefficients of the professional role and of the interaction is not significantly different from zero ($p=0.055$, not shown). Given

that in all the other cases this sum is significantly less than zero, this means that, with the exception of the obstetricians, the median preparation of the other roles is significantly lower than the median preparation of paediatricians.

In terms of unpreparedness, we would like to point out the estimated coefficients $\beta_{IU_{50}}$ and $\beta_{IU_{75}}$ for physicians and other roles, which are not cancelled when summed with the estimates of the interaction.

This underlines a generally higher unpreparedness among these roles when compared with paediatricians, and this conclusion can be drawn regardless of gender. However, if we do not consider the paediatricians, this unpreparedness is much lower among females than among males.

It is also interesting to draw attention to the physicians' level of preparation, which is much worse than that of paediatricians. It is important to remember that these physicians are mainly gynaecologists, whose major role ends at the time of the child's birth. However, this result highlights the excessive specialisation of their knowledge, which should not lead to such a significant knowledge gap about SIDS and its risk factors.

Finally, it is interesting to consider the region, which has been included in the model because in Italy healthcare policies are a regional responsibility. Taking Veneto as reference, it is possible to spot many regions that behave differently. Friuli Venezia Giulia is the only region to show a significantly lower unpreparedness both for the median ($\beta_{IU_{50}} = -0.235$, $p=0.011$) and the 75th percentile ($\beta_{IU_{75}} = -0.308$, $p<0.001$). Since in this region training courses have been carried out for some years before this survey, this result is of particular interest, as it confirms their positive effect. However, even if they seem to have effectively reduced the amount of unprepared healthcare professionals, they do not seem to have been as effective in increasing the number of prepared ones.

On the other hand, Aosta Valley, Apulia, Lazio, Lombardy, and Sardinia present a significantly worse performance in terms of one or both indices. The worst case seems to be that of Lazio, for which highly significant coefficient estimates ($p<0.001$) were found for the median and the 75th percentile both when the IP and when the IU were considered. As for Aosta Valley and Lombardy, the differences seem to affect only the healthcare professionals' unpreparedness, while in terms of preparation they do not behave differently from their colleagues in Veneto. In any case, all these differences that can be

attributed to a regional effect are important indices of an important structural issue, and, in some cases, of a serious lack of information about SIDS.

6.5. Conclusions

The aetiology of SIDS is still largely unknown, but over time SIDS has become more and more preventable as specific risk factors have been identified. For this reason, it is of paramount importance to have an effective training process aimed at healthcare professionals, who are the front-line healthcare providers for newborns and sources of information for their parents.

This chapter shows the varying levels of knowledge different healthcare professionals have concerning protective factors and SIDS. In particular, the professional role and the workplace are strong differentiators: paediatricians (and after them obstetricians) are the most qualified professionals, with a higher level of knowledge than other healthcare professionals, including other physicians. This finding is in line with what has been found in previous studies, even if the existing findings exclusively related to the knowledge of the correct sleep position, while ours extend this conclusion to the knowledge of other risk factors. *Ceteris paribus*, a significant disparity in knowledge exists between professionals working in birth centres and family planning clinics and those working in other types of healthcare centres. This disparity according to workplace is particularly relevant because parents do not generally seek care for the newborns at birth centres after childbirth. Family planning clinics also are not generally primary care providers for families. In fact, since inception of the family planning clinics in 1975, the debate concerning how they could be used more often and more effectively has recurred often, even if today this debate is often reduced to their activity of certification for induced abortion. The parents of newborn infants usually seek care for their infants at vaccination centres, hospitals, and medical clinics, both for specialist visits and for emergencies. Training in risk and protective factors for SIDS should be intensified at these care locations.

It has been noticed how spatial variables are significant: the decreased unpreparedness of healthcare professionals in Friuli Venezia Giulia can be plausibly attributed to a previous training campaign. This campaign (named 'Progetto 6+1') was run some years before this survey was undertaken, and

Friuli Venezia Giulia was the only region involved in both campaigns. This result, although speculative, confirms the conclusions of previous studies: training initiatives about SIDS and its risk factors have a positive effect in increasing healthcare professionals' knowledge. On the other hand, in some regions the preparation is significantly lower; this means that strategic choices about formative policies have a considerable effect on the real preparation of the professionals. Our results show how different strategic decisions regarding the training of healthcare professionals can bring tangibly different results.

It is relieving to notice that the results of the preliminary analysis did not differ from the ones that were achieved with a more thorough approach. However, we believe that the more comprehensive approach (the one which focused both on preparation and unpreparedness) provides readers and policymakers with a deeper understanding of the Italian reality.

This work is important because it is the first national survey on healthcare professionals' knowledge of SIDS. The survey responds to legislative objectives defined in 2006. On the other hand, the study has some limitations: the involvement of the regions in the project was voluntary, so there is the risk of a systematic distortion caused by different levels of knowledge of healthcare professionals belonging to non-participating regions. Unfortunately, this issue could not be addressed because of the impossibility of a comparison between the regions that participated in the campaign and those which did not. Therefore, in light of the results reported in this chapter, it would be desirable to implement a survey that would make use of a probability sample in future studies. Another limitation might be given by the fact that the study is centred on Italy and the decisions of its policymakers. Some risk factors that were deemed important and included in the survey, in fact, are still debated by the scientific community. Other risk factors that are still debated by the scientific community, instead, were excluded from the survey. As a consequence, the findings of this study may not apply, without appropriate adjustments, to populations whose policymakers do not share the same point of view of their Italian homologues. Moreover, some healthcare professionals might not necessarily have given the wrong answer out of ignorance but rather because they are aware of current issues surrounding SIDS risk reduction messages. As a consequence, they could have felt confused when asked to choose an answer without the possibility of giving further explanations, possibly accounting for a further source of bias.

7. General practitioners' knowledge about SIDS in the UK: the results of the SIDS Project

This chapter analyses the data for the United Kingdom resulting from the SIDS Project, a survey designed to provide the first data about general practitioners' (GPs) knowledge and behaviour about SIDS and its risk factors in the United Kingdom.

The survey investigated whether GPs know that the supine sleep position alone is the best to reduce the risk of SIDS on the basis of their demographic and professional background. We verify what the GPs' overall level of knowledge about all SIDS risk factors is and investigate if they recommend exclusively the supine sleep position to newborns' parents. The survey also collected data on a range of covariates, and the association of these with awareness of and recommendations about the best sleep position to reduce the risk of SIDS was examined.

Gender, age, having children, number of practices where the GP works and direct experience of a case of SIDS were the factors most closely associated with the outcome variables. Significant regional differences emerged and are likely to be the result of training and prevention campaigns undertaken in some regions.

7.1. Introduction

All GPs working in the South Central Strategic Health Authority (which includes the counties of Berkshire, Buckinghamshire, Hampshire, Isle of Wight and Oxfordshire) were chosen as the target population. GPs are generalist physicians and usually represent the first contact between an individual and the National Health Service (NHS). Contrary to most of the healthcare professionals that were analysed in the Italian survey, GPs are not required a post-graduate title in paediatrics and child health or in a related field (even though they can earn one) so they should be assumed to be the equivalent of the Italian figure of the Family Physician.

The choice of the GPs was made building upon the fact that they have a long-term relationship of trust and confidence with infants' parents and because parents often refer to their GP to seek advice and recommendations for issues about their infants. Originally, it was considered that midwives and health visitors could have been included in the target population as well. However, for the reasons mentioned in Section 3.1 (page 27) they were not chosen as final target population.

7.1.1. Aims of the present work

The first aim of this work is to analyse GPs' knowledge about the most important risk factor for SIDS: the sleep position. In order to do so, we investigate if GPs know that the supine sleep position alone is the best to reduce the risk of SIDS and we describe those who know it and those who do not on the basis of their demographic and professional background. This objective is achieved by analysing GPs' knowledge about the best sleep position as a function of an explanatory variable set (Table 7.1) that identifies the different types and characteristics of GPs.

Second, considering that a GP may have to discuss also all the other SIDS risk factors with parents, we want to verify what is the GPs' overall level of knowledge of all SIDS risk factors. Once again, this analysis is carried out on the basis of their demographic and professional background. To achieve this, we build an index of knowledge for all GPs and analyse it as a function of the above mentioned set of explanatory variables.

Finally we analyse GPs' recommendations about infant sleep position. We investigate if they recommend exclusively the supine sleep position and to be able to describe those who recommend it and those who do not on the basis of their demographic and professional background. This objective is achieved by describing the demographic and professional background of those GPs recommending exclusively the supine sleeping position. This last analysis is performed accounting for the fact that not all respondents stated that they discuss this topic with parents.

7.2. Data

The study consists of a mail survey which was carried out in the United Kingdom between May and July 2012. As mentioned in Section 3.1 (page 27),

the dimension of the task and the lack of existing information on this topic made us choose to implement the survey only in one region of the country: the NHS South Central Strategic Health Authority. At the beginning of 2012 this area accounted for 7.0% ($n=4,431,688$) of the population of the United Kingdom (Source: Office for National Statistics, Northern Ireland Statistics and Research Agency, National Records of Scotland).

The sample frame was retrieved through the website of the NHS. However, the list had been updated for the last time in November 2010, which was about 17 months before the survey started. This could be the source of some bias, especially in terms of retired physicians and newly employed ones, but it was not possible to take any action in order to prevent it or reduce it. Of course, bias would occur only if the characteristics of the retired doctors were different from those of the newly employed ones. This might be the case, for example if most of those retiring were British, yet many new recruits had been trained overseas. There is also the possibility of migration by doctors, though migration within the United Kingdom is probably small in magnitude.

A previously validated questionnaire was updated with additional details (de Luca and Boccuzzo, 2013). The variables of interest used for this chapter consist of one question about knowledge of the safest sleep position, 14 questions about SIDS risk factors and one question regarding recommendations about the sleep position and their frequency. Demographic variables were also included. Response to the survey was considered to imply consent to participate.

Basic descriptive statistics for the survey are shown in Table 7.1. There were no statistically significant differences in response rates by county. There were slightly more females ($n=180$, 51.6%) than males, and the majority of GPs (85.5%) obtained their medical qualification in the UK. Other personal and practice demographic information is shown in Table 7.1.

The data analysis that is presented was performed with the statistical software Stata (StataCorp, 2011). Descriptive statistics were calculated both for demographic characteristics of the sample and for all the questions of interest. Additionally, we adapted a sample selection model by using the `heckprob` command (De Luca, 2008; Chiburis and Lokshin, 2007; Miranda and Rabe-Hesketh, 2006) and a logistic quantile regression by using the `lqreg` command (Orsini and Bottai, 2011).

Table 7.1. Descriptive statistics of the sample (% if not otherwise stated)

Variable	Categories	Respondents (n=349)
Gender	Male	48.4
	Female	51.6
Children	No children	11.6
	Aged 0-3	15.6
	Aged 3 or more	72.5
Citizenship	UK	93.7
	Other	6.3
Country of medical qualification	UK	88.5
	Other	11.5
Number of practices where the GP works	One	84.5
	Two or more	15.5
County	Berkshire	16.9
	Buckinghamshire	13.5
	Hampshire	35.2
	Oxfordshire	18.3
	Isle of Wight [†]	16.1
City of the practice's size	< 10k	28.2
	10k ≤ & < 20k	15.2
	20k ≤ & < 40k	14.4
	40k ≤ & < 100k	18.7
	≥ 100k	23.6
GP with more female colleagues than males		41.0
GP did a placement in child health and paediatrics		76.2
GP holds a post-graduate degree in child health and paediatrics		26.4
GP has direct experience of a case of SIDS		45.1
Average age (SE)		47.5 (0.46)
Average years of experience (SE)		16.6 (0.48)
Average number of colleagues in the workplace (SE)		6.5 (0.14)

[†] The Primary Care Trusts of the cities of Southampton and Portsmouth and the Isle of Wight were grouped together in order to balance the counties' sample sizes.

Source: The SIDS Project, British survey.

7.3. Methods

7.3.1. Log binomial regression

Because there have been many campaigns advocating the supine position as the safest one for SIDS prevention, we expected GPs who did not know this to be rare. However the first descriptive statistics revealed that this was not the case. In fact, of all the 349 respondents, 46 (13.2%) did not give the correct answer about the safest sleep position, a number which is too high to rely on the approximation of the risk ratios given by the odds ratios. Considering that we were interested in giving readers the actual risk ratios (or any acceptable approximation), we could not use anymore a logistic regression for trying to identify the respondents who did not reply correctly.

As a consequence, we adapted to the data a log binomial model (which was described in Section 5.3, page 64). In this case we did not detect any predicted probabilities not bounded between 0 and 1 or non-convergence of the model. The predicted probabilities of a positive outcome for the model (that is of knowing that the supine position is the safest against SIDS) varied between 0.685 and 0.950, while all estimates were retrieved after the model successfully converged.

7.3.2. Building an index of GPs' knowledge

In order to build an index of GPs' knowledge about SIDS and its risk factors we considered the following 14 items that were included under the same question (*'What effects do you believe that the following behaviours have on the risk of SIDS?'*). Respondents could choose between *'it lowers the risk'*, *'it increases the risk'*, *'it does not affect the risk'* and *'I do not know'*, and the correct answers are given here below in brackets:

- placing infants for sleep in a supine position (lowers the risk);
- offering infants a pacifier at nap time and bedtime (lowers the risk);
- using a soft crib mattress (increases the risk);
- allowing infants to sleep in the same bed as their parents (increases the risk);
- encouraging tummy time when the infant is awake and observed (does not affect the risk);

- making up the bedding so that the infant's feet reach the foot of the crib (lowers the risk);
- performing an electrocardiogram (ECG) on the infant (does not affect the risk);
- keeping the bedroom temperature below 20° C (lowers the risk);
- maternal smoking during pregnancy (increases the risk);
- allowing infants to sleep in the same room as their parents (lowers the risk);
- breastfeeding (lowers the risk);
- placing soft objects such as pillows, quilts and stuffed toys in the crib (increases the risk);
- smoking (both maternal and paternal) in the infant's environment (increases the risk);
- sleeping with an infant on a couch/armchair (increases the risk).

As we already focused our attention on the most important risk factor for SIDS when we analysed the knowledge about the sleep position, in this phase of the analysis we decided to attribute the same importance to all items. Consequently, the index of overall knowledge about SIDS risk factors consisted of the proportion of correct answers given by each respondent to the abovementioned items. Furthermore, this approach allowed us to use the responses given by all respondents, without having to discard a whole record if the answer to any of the items was not given. In such cases, in fact, we calculated the proportion of correct answers over the number of valid answers provided.

7.3.3. Quantile regression

One of the main objectives of this research is to determine which demographic and professional characteristics significantly affect GPs' knowledge about SIDS and its risk factors. To this end, we modelled the index of knowledge using the quantile regression approach (which was described in Section 6.3.3, page 83). The advantages of using quantile regression are that (1) it allows us to analyse the determinants of knowledge at the extreme values of the indices and (2) it allows us to model variables for which the normality assumption may not hold and which, at the same time, describe bounded outcomes (as in this case).

7.3.4. Sample selection model

The last objective of our research is to understand the characteristics of the GPs that give parents the correct recommendation about the sleeping position. Given that not all GPs talk with parents about the best sleep position, it is necessary to model both the variable $S = \text{'GP talks with parents'}$ and, among those GPs that do talk with parents about the best sleep position, the variable $Y = \text{'GP gives the correct recommendation'}$. Namely, Y is observed only if a selection condition is met. In this case, modelling two independent equations with standard regression techniques results in biased and inconsistent estimators if unobserved factors affecting Y are correlated with unobserved factors affecting the selection process S (Heckman, 1979).

A sample selection model should be applied, but, contrarily to the classical Heckman's model, in our case the variable of interest Y is binary and not continuous. In order to account for this difference, then, we apply a model formulated as a system of equations for two latent responses, y_i^* and S_i^* (Miranda and Rabe-Hesketh, 2006):

$$y_i^* = \mathbf{x}_i' \boldsymbol{\beta} + u_i \quad (7.1)$$

$$S_i^* = \mathbf{z}_i' \boldsymbol{\gamma} + v_i \quad (7.2)$$

where:

y_i^* and S_i^* are latent continuous variables;

\mathbf{x}_i (of dimensions $K \times 1$) and \mathbf{z}_i ($L \times 1$) are vectors of explanatory variables;

$\boldsymbol{\beta}$ ($K \times 1$) and $\boldsymbol{\gamma}$ ($L \times 1$) are vectors of parameters to be estimated.

The observed responses are generated as:

$$y_i = \begin{cases} 1 & \text{if } y_i^* > 0 \\ 0 & \text{otherwise} \end{cases} \quad (7.3)$$

$$S_i = \begin{cases} 1 & \text{if } S_i^* > 0 \\ 0 & \text{otherwise} \end{cases} \quad (7.4)$$

A bivariate normal distribution is assumed for u_i and v_i . A shared random effect ε_i is used to induce the dependence between u_i and v_i :

$$u_i = \lambda \varepsilon_i + \tau_i \quad (7.5)$$

$$v_i = \varepsilon_i + \zeta_i \quad (7.6)$$

where:

ε_i , τ_i and ζ_i are normally distributed with mean 0 and variance 1;

λ is a parameter to be estimated.

The correlation between u_i and v_i is $\rho = \frac{\lambda}{\sqrt{2(\lambda^2+1)}}$. If $\rho = 0$, consistent

estimates of β and γ are obtained with ordinary probit regression models; if $\rho \neq 0$, estimates are inconsistent. Consistent estimators can be obtained by maximum likelihood estimation of a joint probit model of the outcome and selection variable (Miranda and Rabe-Hesketh, 2006), where the log-likelihood is evaluated using adaptive quadrature (Rabe-Hesketh et al., 2002).

7.4. Results

7.4.1. GPs' knowledge about the safest infant sleep position

We began our analysis by investigating GPs' knowledge about SIDS most important risk factor, which is the infant sleep position. Of all the 349 respondents, 46 (13.2%) did not give the correct answer about the safest sleep position, a number which is high given the importance of this risk factor and considering how many efforts and resources have been invested over the years to spread awareness of the sleep position among newborns' parents and healthcare professionals. We modelled the data with a log binomial regression, the results of which are described in Table 7.2.

We present in the model the only two explanatory variables that significantly influenced the probability of knowing the correct position: '*age*' and '*whether the GP works in only one practice or not*'. In the multivariate model we used a standard backwards selection, and even the variable '*age*' lost some of its significance. However, given the difficulty in identifying the respondents who had a correct knowledge, we decided to leave it in the model. As it can be seen in Table 7.2, older GPs show a lower likelihood of having a correct knowledge, which could mean that since they received their training about SIDS and its risk factors they have not received any further update. Alternatively, this could mean that their interest in this topic decreases over time as they get into midlife, which might happen if GPs' practices tend to ask younger doctors to communicate with parents, on the grounds that they are of

a similar age. Parents might be inclined to listen more to the advice of GPs who also have their own young children, than to the advice of elderly (especially elderly male) doctors. In both cases, this represents a very dangerous situation in a field where even the best practice concerning the most important risk factor can change quickly according to the latest scientific evidence.

As for the variable that describes the number of practices where the GPs work, we interpreted it as the effect of the precariousness of their role. As these GPs are not as present in the surgery as a GP who works exclusively there, we hypothesized that they are less '*exposed*' to children's issues. This hypothesis was made considering that mothers may be inclined to discuss these topics with the GP they have always dealt with (and who possibly has been their '*own*' GP since they were little girls) rather than with a GP they may not be very familiar with.

Table 7.2. Determinants of GPs' correct knowledge about the safest infant sleep position

Variable	Risk Ratio	Std. Error	Signif.	95% CI	
Age (centred)	0.996	0.002	0.060	0.992	1.000
GP works in only one practice vs. GP works in 2 or more practices (<i>ref.</i>)	1.217	0.106	0.025	1.026	1.445

Source: The SIDS Project, British survey.

7.4.2. GPs' knowledge about 14 SIDS risk factors

In the second phase of the analysis we moved the focus of our attention from the most important risk factor for SIDS (the sleep position) to a set of 14 different items, covering all the different risk factors for SIDS. As we were interested in investigating potential differences in the effect of the explanatory variables according to a specific level of knowledge, we modelled our data with a quantile logistic regression, and we looked at the results for the 20th, 50th and 80th percentiles (Table 7.3).

As it can be seen from Table 7.3, the variables that are associated with a higher level of knowledge about all SIDS risk factors can be divided into professional and personal. From a professional perspective, it is worth pointing out the surprising absence of the variable identifying those GPs holding a post-graduate qualification in child health and paediatrics. This is surprising

as the syllabuses of the topics whose knowledge is required for obtaining titles such as the Diploma in Child Health, in fact, specifically include SIDS and its risk factors. Instead, what significantly increases GPs' knowledge is an eventual direct experience of a case of SIDS, while seniority, which is highly correlated with age ($\rho=0.894$, $p<0.001$), tends to have a detrimental effect. As observed in the previous section, this could mean that once GPs have received their initial training about SIDS and its risk factors they do not get any further update, thus being at risk of not receiving the newest updates according to the latest epidemiological findings. At the low levels of knowledge, finally, those GPs that work in only one practice show a significantly higher knowledge than their colleagues working in two practices or more, thus confirming the results that were presented in the previous section.

Table 7.3. Determinants of GPs' correct knowledge about the 14 risk factors by percentile (coefficients of the quantile regression)

Variable	20 th percentile	50 th percentile	80 th percentile
Direct experience of a case of SIDS	0.303**	0.160	0.338*
Seniority (for 10 years)	-0.188*	-0.214**	-0.125
GP works in only one practice	0.385**	0.053	0.063
Gender	0.397***	0.468***	0.450***
GP has children	0.034	0.213	0.429**
GP has children under 3	0.235	0.191	0.375*
Constant	0.097	0.555***	0.675***

* p -value between 0.01 and 0.05, ** p -value between 0.001 and 0.01 and

*** p -value less than 0.001.

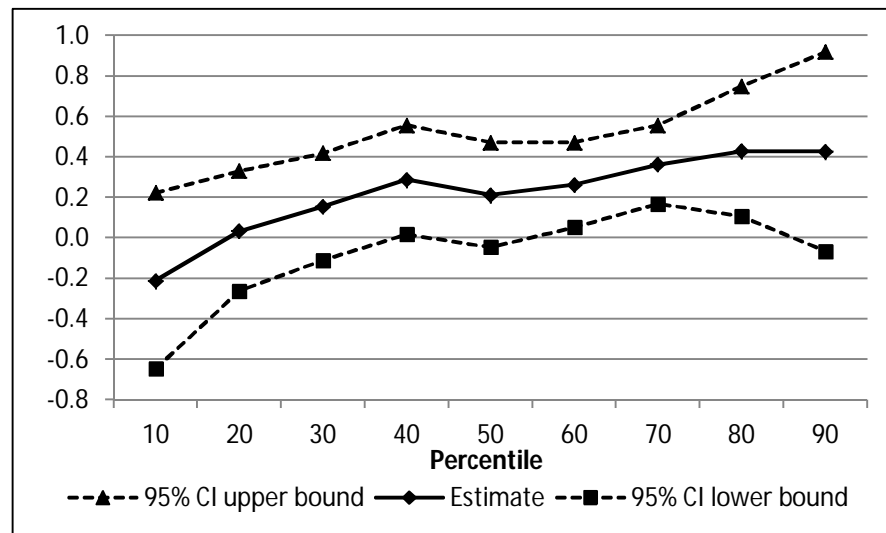
Source: The SIDS Project, British survey.

Considering personal characteristics, instead, it is possible to see how the factors that may influence GPs' interest on this topic (such as being a woman, having children or having children under 3) play a major role in determining GPs' overall knowledge about SIDS. As knowledge increases these two variables also acquire further importance. The highest differences between high and low knowledge are recorded for the variable about having children, which is among the best proxy variables for the respondents' personal interest in this topic.

In Figure 7.1 and Figure 7.2 we display how the parameters associated with 'GP has got children' and 'seniority' (for 10 years) change across the different

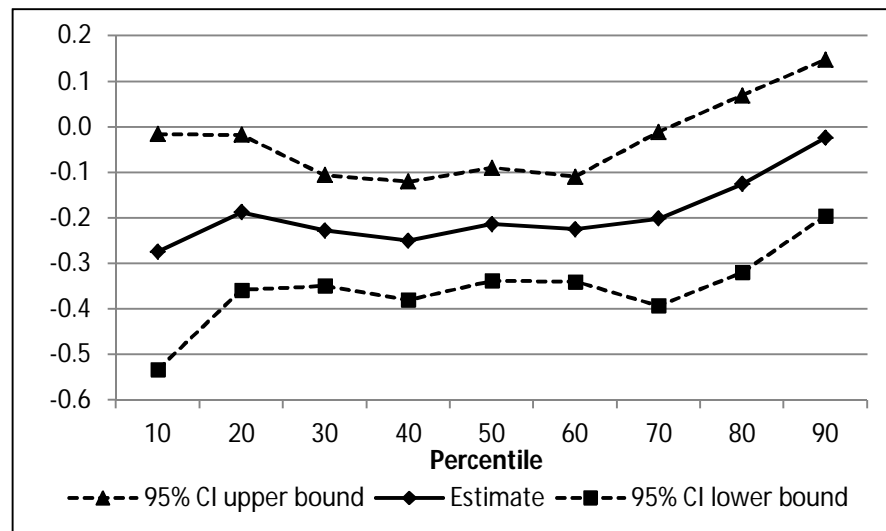
percentiles of the distribution of the index of knowledge. For both variables we can see an increasing trend as we consider higher levels of knowledge, a trend which is not present for the other variables (figures not reported).

Figure 7.1. Effect of 'GP has got children' on GPs' knowledge (and 95% Confidence Interval [CI] upper and lower bounds) by different percentiles of the index of knowledge



Source: The SIDS Project, British survey.

Figure 7.2. Effect of 'seniority' (for 10 years) on GPs' knowledge (and 95% CI upper and lower bounds) by different percentiles of the index of knowledge



Source: The SIDS Project, British survey.

7.4.3. GPs' recommendations to parents about infant sleep positioning

In the last phase of our analysis we investigate GPs' recommendations about infant sleep positioning. After considering what GPs know about the safest sleep position and, more broadly, about all SIDS risk factors, we now want to identify those who recommend exclusively the supine sleep position and those who do not on the basis of their demographic and professional background.

To do so, we first have to take into account the fact that not all GPs stated that they discussed this issue with parents. In fact, of our 349 respondents only 211 (60.5%) declared that they talk with parents about how they should put their babies to sleep. In order to properly consider this selection process, then, we modelled our data with a sample selection model for binary data.

When we analysed the profile of the GPs that discuss with parents about the children sleeping position it emerged that having directly experienced a case of SIDS was the strongest determinant (the coefficient 0.427 - Table 7.4 - implies a risk ratio of 1.32). Moreover, it is very interesting to point out the regional effect that emerged associated with the county of Hampshire (excluding the cities of Portsmouth and Southampton which were grouped together with the Isle of Wight). As we can see from Table 7.4, GPs in Hampshire were more likely to discuss with parents this issue (with a coefficient of 0.507, which corresponds to a risk ratio of 1.42 with respect to Berkshire). Indeed, 70.2% of GPs from Hampshire talk with parents, versus 55.7% of GPs from other counties. However, the SIDS rate in Hampshire (0.20 in 2011 [data retrieved from the Vital Statistics Tables produced by the Office for National Statistics]) is not the highest in the region (it was 0.37 in Berkshire) and it is not higher than the average country level for England and Wales (0.40 in 2010). It follows that this result cannot be explained by a higher attention to the problem due to a high incidence of SIDS. Instead, it can be explained by the fact that since 2008 (when the '*SIDS 10th International Conference*' was held in Portsmouth) in many areas of Hampshire there has been an active SIDS prevention campaign named Safer Babies. This campaign was backed by the Hampshire's Safeguarding Children's Board (which is responsible for co-ordinating and ensuring the effectiveness of local work to safeguard and promote the welfare of children) and promoted good care practices in a bid to reduce the risk of SIDS. The result presented in this analysis, then, can be interpreted as the consequence of an increased

awareness caused by this campaign. This is very encouraging in terms of evaluation of the effectiveness of prevention campaigns, and it is in line with similar regional effects that were found in Italy (de Luca and Boccuzzo, 2013).

Table 7.4. Estimates of GPs' frequency in talking with parents about the safest position for infants and their correct recommendation (probit sample selection model)

(1) Selection model: GP talks at least once a month with parents about the correct sleep position

Variable	Coeff.	Std. Err.	Signif.	95% CI	
Intercept	-0.307	0.192	0.110	-0.684	0.069
Gender (female)	0.268	0.140	0.056	-0.007	0.544
Direct exp. of a case of SIDS	0.427	0.153	0.005	0.127	0.728
County (<i>Ref</i> : Berkshire)					
Buckinghamshire	0.274	0.305	0.370	-0.325	0.872
Hampshire	0.507	0.223	0.023	0.070	0.944
Oxfordshire	0.022	0.231	0.925	-0.433	0.476
Isle of Wight [†]	0.261	0.245	0.286	-0.219	0.740

(2) Main model: GP gives the correct recommendation about the infants sleep position

Variable	Coeff.	Std. Err.	Signif.	95% CI	
Intercept	2.370	0.940	0.012	0.528	4.211
Gender (female)	0.808	0.354	0.023	0.114	1.503
GP works in only one practice	1.387	0.357	0.000	0.687	2.087
Avg. numb. of colleagues	-0.130	0.059	0.029	-0.246	-0.013
Rho	0.098	0.984	0.921	-0.952	0.967

[†] The Primary Care Trusts of the cities of Southampton and Portsmouth and the Isle of Wight were grouped together in order to balance the counties' sample sizes.

Source: The SIDS Project, British survey.

Among the GPs that give parents a recommendation about the babies sleep position, those that were more likely to recommend exclusively the supine position were women, the GPs that work with few colleagues and the GPs that work in only one practice rather than those that work in two or more (with a coefficient 1.387, corresponding to a risk ratio of 1.30). Once again, we can only speculate about the meaning of these results. The importance given to the

variable expressing the average number of colleagues was attributed to a higher exposure to children' issues: a higher number of colleagues can imply a lower presence of a specific GP in the practice, thus meaning for this GP a lower chance of being chosen as '*reference GP*' by parents with children.

As for the number of practices where the GPs work, we thought at first that, because these GPs work in a single practice, they could be more exposed to children' issues because mothers may seek advice from them rather than from those GPs who are not always available at the practice. However, if this was the case, this variable should have appeared as a significant factor in the selection model as well, but it did not happen. Instead, the variable fitted only the '*knowledge*' model. This suggests that GPs may talk about this issue just as much, but the ones that are more knowledgeable (i.e. working only in one practice) give better recommendations. As a consequence, new hypotheses about the higher knowledge possessed by those GPs who work in a single practice need to be formulated.

7.5. Conclusions

Despite the causes of SIDS still being unknown, the results of many epidemiological studies have encouraged the implementation of more and more interventions in order to try to prevent it. This was possible because specific risk factors have been identified. For this reason, it is of paramount importance to insure that their knowledge is effectively and promptly transmitted to healthcare professionals, who are the front-line healthcare providers for newborns, and sources of information for their parents.

This research presents for the first time in the United Kingdom an analysis of GPs' knowledge about the importance of the babies' sleep position and other risk factors for SIDS. Additionally, it also shows who are the GPs that exclusively recommend the supine position and those who do not and that, regardless of all the prevention campaigns that were run in these years, approximately 13% of GPs still do not give the correct answer about the safest sleep position (which represent the most basic knowledge in this topic). This means that there is still a lot to do for increasing awareness among healthcare professionals.

Looking at GPs' knowledge about the safest sleep position, we show that younger GPs tend to have a better knowledge, suggesting that their older

colleagues may not be as prepared because they did not get any further update about the latest scientific evidence. As a consequence they may not be aware that even the best practice concerning the most important risk factor has quickly changed in these last years. Moreover, GPs working in a single practice also presented a higher likelihood of having a correct knowledge about the sleep position, and we believe that this is the results of mothers seeking more often the advice of the GP they have always dealt with rather than that of the GPs that are only seldom at the surgery that they refer to. Other possible explanations, however, may lead to some unobserved characteristics of the GPs who work between several practices or to the kinds of patients they see.

In terms of the overall knowledge about SIDS risk factors, we were surprised not to see the variable identifying the GPs holding a post-graduate title in child health and paediatrics among the explanatory variables which significantly contributed to describe it. Instead, what significantly increases GPs' knowledge is a direct experience of a case of SIDS, while seniority has a detrimental effect. As observed in the previous paragraph, this could mean that once GPs have received their initial training about SIDS and its risk factors they do not get any further update, thus being at risk of not receiving the newest updates according to the latest epidemiological findings. *'Being a woman'*, *'having children'* and *'having children under 3'* increased the chance of correct knowledge and the latter two variables acquired further importance as we considered higher levels of knowledge. Finally, when we looked at the recommendations given to parents by GPs, we noticed that the GPs who are more likely to discuss this issue with parents are those who had a direct experience of a case of SIDS. We also noticed a regional effect for the county of Hampshire, which we believe it is the result of the prevention campaign named Safer Babies, carried out since 2008 in many areas of the county. This is very encouraging result in terms of evaluation of the effectiveness of prevention campaigns, and it confirms similar regional effects that were found in other researches.

Among the GPs that talk with parents about the babies sleep position, those that were more likely to recommend exclusively the supine position were women and those that work in only one practice with a limited number of colleagues. While the first variable probably summarizes the GPs' personal interest in this topic, in the second case we were inclined to think that the GPs who work in more than one practice are less exposed to children' issues

because mothers may not seek advice from them (instead, mothers may prefer to ask those GPs who are always available at the practice they refer to).

However, the selection model in Table 7.4 does not seem to corroborate this hypothesis, so further efforts should be made in order to explain why GPs who work in a single practice possess a higher knowledge on this topic than their colleagues working in two practices or more.

This work is important because it provides the first data on GPs' knowledge about SIDS and its risk factors in the United Kingdom. Further contributions are much needed, especially about the knowledge on this topic of midwives and health visitors, two classes of healthcare professional who commonly interact with the newborns' parents in the United Kingdom. It would also be very interesting to see whether the conclusions that were drawn in this article apply to the other regions of the country. However, the study has some limitations: the response rate was quite low, although it was higher than most of the studies that were found in the literature in this topic. The use of a *token of appreciation* might have helped to increase the response rate, but its use was not possible due to budget constraints. Considering the increasingly higher use of the internet that also involves healthcare professionals, we highly recommend, if possible, striving for retrieving the list of sample members' email addresses. This way, a third reminder would be possible and some participants would surely prefer to respond this way rather than using pen and paper. Another limitation might be given by the fact that the sample frame was retrieved through the website of the NHS about 17 months before the survey started. This could have been the source of some bias, especially in terms of retired physicians and newly employed ones, but it was not possible to take any action in order to prevent it or reduce it. A natural extension of the analysis that was presented in Section 7.3.4 would be to include the response to the survey as an additional step in the sample selection model. In fact, motivations and/or knowledge may conceivably affect not only the frequency with which professionals give recommendations, but also their behaviour in terms of survey response. Therefore survey response is likely another step of '*information selection*' and constructing a '*three levels*' sample selection model would probably help discovering further information about the mechanism underlying all three of them.

8. Paediatricians' knowledge about SIDS and its risk factors in the provinces of Barcelona, Lérida and Tarragona

8.1. Introduction

In the pathogenesis of SIDS there is a converge of factors that correspond to the critical period of development in which it occurs and to the intrinsic vulnerability of the infant (immature cardiorespiratory and arousal systems) with external factors or triggers such as the sleep position, overbundling, and airway obstruction (Task Force on SIDS, 2011b).

However, as mentioned in Section 2.4 (page 20), there are several precautions that can be taken in order to reduce the risk of SIDS. In the last 20 years, many prevention campaigns targeted caregivers and healthcare professionals in the USA in order to increase their knowledge on this topic, and they had a very positive effect (Hauck and Tanabe, 2009; Moon et al., 2008; Moon et al., 2004; Moon and Oden, 2003; Colson and Joslin, 2002). The American Academy of Pediatrics (AAP) recommends that *'all physicians, nurses, and other health care professionals should receive education on safe infant sleep'*, and suggests that they should develop initiatives that promote adherence to prevention guidelines among their patients (Task Force on SIDS, 2011a).

The first study to have been run in Spain about SIDS and its risk factors dates back to 1986. In that year, five paediatric hospitals combined together their efforts to select, under common criteria, those infants that were at risk of SIDS, and to enrol them in a program of cardio-respiratory home monitoring (Mesa Redonda *'Síndrome de muerte súbita del lactante'*, 1987). Before this one, only a limited number of studies about SIDS had been done in this country, of which all but one were updates about the results achieved by researches carried out in other countries. Moreover, paediatricians themselves were little acknowledged about this topic and little attention was given to SIDS by the national healthcare system (Camarasa Piquer, 2003). Even the national mortality rate attributable to SIDS was not reliable, as it was not compulsory to

run a systematic autopsy in case of sudden infant deaths (Camarasa Piquer, 1991). However, the study of 1986, followed by a round table run by the Spanish Association of Paediatrics (Asociación Española de Pediatría, AEP) in 1987, draw the attention of the government and of healthcare professionals to this topic, which ultimately led to many researches and scientific articles (Camarasa Piquer, 2003). In 1991 the AEP established the Working Group for the Study and Prevention of SIDS, within which it was possible to appreciate the interaction between all the different medical specialties involved in SIDS prevention (paediatricians, pathologists, forensic, epidemiologists, biochemists, neurophysiologists, researchers, psychologists, sociologists, etc.) and where all the 12 regional societies of paediatrics were represented (Camarasa Piquer, 2003). The AEP also ensured the endorsement by these regional societies of all the protocols approved by the Working Group.

From that moment, Camarasa-Piquer notes that there was a marked improvement in the awareness of society and of healthcare professionals about SIDS. This was made possible through various initiatives and prevention campaigns, such as '*Ponle a dormir boca arriba*' (Put them to sleep face up) which was launched in 2000 (Camarasa Piquer, 2003). However, actual data on healthcare professionals' knowledge on this topic and on its transmission from healthcare professionals to newborns' parents does not exist.

The chapter presents the first results of the SIDS Project's survey that was carried out in Cataluña, and explores the dissemination of knowledge about SIDS and its risk factors among healthcare professionals. Moreover, it investigates the access and use of this new knowledge by those professionals who are responsible for advising newborns' parents.

8.2. Data and methods

The survey consisted of a descriptive cross-sectional study carried out between November 2012 and April 2013 in the provinces of Barcelona, Lérida and Tarragona. The sample frame was retrieved through the databases of the Col·legi Oficial de Metges of the three provinces, and included all those physicians with a registered specialty in paediatrics. As the aim of the survey was to gather data from practicing paediatricians, those that were aged 71 or more were excluded from the study.

The questionnaire that was used was based on a previously validated one (de Luca and Boccuzzo, 2013) which was updated with additional details. The questionnaire included questions about the demographic and professional background of the respondents, the clinical practice about SIDS, self-perception in terms of knowledge and confidence in discussing with parents these topics, the recommended sleep position and 15 risk factors for SIDS. During the analysis of the data, however, it was chosen to use the data only for 13 risk factors for SIDS, as it emerged from the responses that two of them (the one about the firmness of the mattress and the one about the temperature of the infant's room) created some confusion among respondents. Response to the survey was considered to imply consent to participate.

We performed a descriptive analysis of all the items of the questionnaire. Categorical data were tabulated in contingency tables and compared using chi-square tests, while continuous variables were compared using Student's t test. The variables of interest were the knowledge about the safest sleep position for infants, the sleep position that paediatricians recommend to parents and the 13 items about SIDS risk factors. All the statistical analyses were performed with the statistical software STATA (StataCorp, 2011).

8.3. Results

The overall sample consisted of 1,202 paediatricians, distributed between the provinces of Barcelona (996), Tarragona (124) and Lérida (82). The overall response rate was 45.9% (43.2% in Barcelona, 54.0% in Tarragona and 67.1% in Lérida), for a total of 552 responses. The demographic and professional characteristics of the respondents are described in Table 8.1.

All respondents (100%) stated that they knew what SIDS was and 63.8% of them had a direct experience of a case of SIDS (0.5% did not reply). Only 34.4% of paediatricians reported having received specific training about SIDS (4.9% did not reply), and, on average, this took place eight years before this survey (with a minimum of one year and maximum of 33 years). The majority of them (62.1%) rated their most recent training about SIDS as satisfactory, while 34.2% reported feeling neither satisfied nor dissatisfied and 1.1% did not express an opinion. Overall, paediatricians self-assessed their knowledge about SIDS and its risk factors as very high (7.4%), somewhat high (56.5%), average (34.2%), somewhat low (1.1%) and very low (0.2%). At the same time, they rated their

confidence in discussing issues related to SIDS with newborns' parents as very high (9.6%), somewhat high (52.7%), average (35.0%) somewhat low (1.6%) and very low (0.7%). More specifically, 93.7% of the respondents perceived themselves as qualified for giving advice and recommendations about SIDS and its risk factors to parents.

Table 8.1. Demographic and professional background of the sample

Variable	Category	%
Gender	Male	36.8
	Female	63.2
Age	Less than 41	14.3
	41-50	22.1
	51-60	44.6
	61-70	19.2
Country of birth	Spain	93.5
	Other	6.2
Country of degree	Spain	96.7
	Other	3.3
Country of specialty	Spain	97.1
	Other	2.7
	Does not reply	0.2
Size of the city of residence	Less than 30k	23.7
	30k - 100k	14.5
	100k - 1M	19.6
	More than 1M	42.2
Seniority	Less than 10 years	11.4
	10 - 20 years	22.3
	More than 20 years	61.6
	Does not reply	4.7
Workplace (it was possible to give more than one response)	CAP	60.7
	Private clinic	15.0
	Private practice	30.3
	Public hospital	27.7
	Private hospital	10.5
Children	None	14.9
	Less than 3 years old	9.2
	More than 3 years old	75.2
	Does not reply	0.7

Source: The SIDS Project, Spanish survey.

Almost one in three of paediatricians (29.7%) reported that they informed parents about SIDS '*more than once a week*', 19.6% said '*about once a week*', 44.0% '*less frequently*' and 6.3% '*never*' (0.4% did not reply). More specifically,

over half (55.3%) stated that they talked with parents of infants about the correct sleep position more than once a week, 23.2% said '*about once a week*', 10.9% said '*two or three times a month*', 4.0% '*about once a month*', 5.3% '*less frequently*' and 1.1% '*never*' (0.4% did not reply). The remarkable difference between the two distributions is quite unexpected. In fact, we have 29.7% of paediatricians informing parents about SIDS more than once a week, yet more than half talking with parents about the correct sleep position more than once a week. This suggests that the respondents may be differentiating between conversations about SIDS and conversations about sleep position, thus not making the link that a conversation about the best sleep position is, effectively, a conversation about SIDS because sleep position is such a fundamental risk factor.

A majority of respondents (57.6%) recognized the supine position as the safest position against SIDS, while 35.7% said supine and/or lateral, 5.3% indicated other positions and 0.4% reported not knowing what position had the lowest risk against SIDS (1.1% did not reply). In terms of recommendations, 57.4% of paediatricians recommended the supine sleep position exclusively, 36.6% side and/or supine, 3.6% other positions, 0.2% said they did not recommend any particular position and 1.1% did not reply. Contrarily to what happened in the previous paragraph, the two distributions (for recognition and recommendation) are very similar in this case.

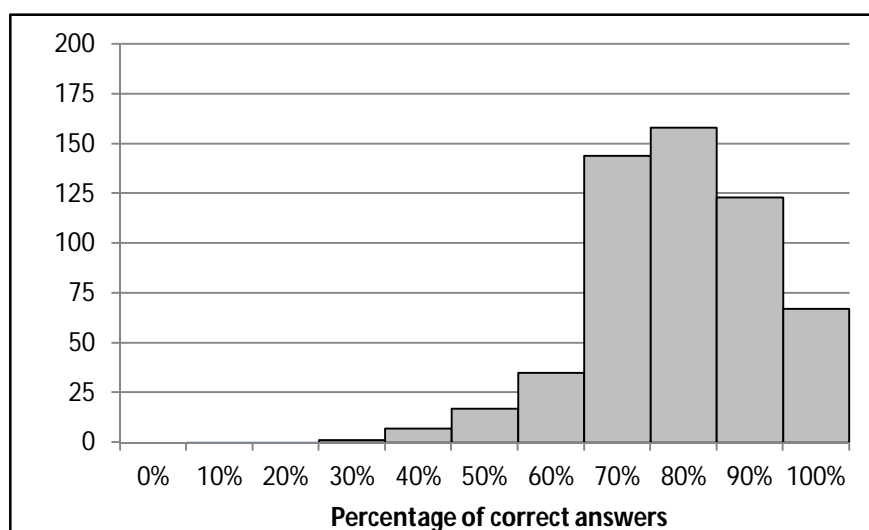
The evaluation that paediatricians gave about the 13 items describing SIDS risk factors is presented in Table 8.2. On average, paediatricians answered correctly to 75.0% of the items included in the table, but only 2.5% of respondents answered all questions correctly. Conversely, 4.5% of paediatricians answered correctly to only half of the questions or less.

In Figure 8.1, instead, it is possible to see how the respondents were distributed in terms of percentage of correct responses.

Table 8.2. Paediatricians' evaluation of the effect that different behaviours have on the risk of SIDS (percentages, correct answers are shaded in grey)

	It lowers the risk	It does not affect the risk	It increases the risk	I do not know	Does not reply
Placing infants for sleep in a supine position	89.0	2.7	6.9	0.4	1.1
Offering infants a pacifier at nap time and bedtime	47.8	31.9	7.1	12.0	1.3
Allowing infants to sleep in the same bed as their parents	3.6	16.5	73.2	4.5	2.2
Encouraging tummy time when the infant is awake and observed	17.8	69.8	8.0	3.8	0.7
Making up the bedding so that the infant's feet reach the foot of the crib	12.3	48.9	4.5	32.8	1.5
Maternal smoking during pregnancy	0.0	2.7	92.0	4.9	0.4
Allowing infants to sleep in the same room as their parents	31.0	56.2	5.6	5.1	2.2
Placing infants for sleep in a prone position	5.1	0.7	92.8	0.5	0.9
Breastfeeding	82.6	14.9	0.0	2.2	0.4
Performing an electrocardiogram (ECG) on the infant	9.1	83.0	0.0	6.9	1.1
Placing soft objects such as pillows, quilts and stuffed toys in the crib	0.0	5.1	91.5	2.9	0.5
Smoking (both maternal and paternal) in the infant's environment	0.0	1.3	96.9	1.5	0.4
Sleeping with an infant on a couch / armchair	0.7	18.3	66.7	13.2	1.1

Source: The SIDS Project, Spanish survey.

Figure 8.1. Distribution of respondents in terms of percentage of correct responses to the effect that different behaviours have on the risk of SIDS

Source: The SIDS Project, Spanish survey.

8.3.1. Factors influencing paediatricians' knowledge about SIDS risk factors

Table 8.3 shows how seniority moderately influences the degree of knowledge about SIDS risk factors in a negative way. This result was expected, because most of these risk factors have been discovered (or updated and changed) quite recently. As a consequence, it is not surprising to see that younger paediatricians have a higher level of knowledge on this topic.

Table 8.3. Relationship between paediatricians' knowledge about SIDS risk factors and the available covariates

	Correlation coefficient	t-value (t-test)	Significance
Seniority	-0.157		<0.001
Years since latest training about SIDS	0.087		0.237
Confidence in discussing issues related to SIDS with newborns' parents	-0.210		<0.001
Knowledge about SIDS and its risk factors	-0.226		<0.001
Has received specific training about SIDS		0.557	0.578
Workplace: CAP		-0.301	0.764
Workplace: Private clinic		0.353	0.724
Workplace: Private practice		-0.378	0.705
Workplace: Public hospital		0.897	0.370
Workplace: Private hospital		-0.472	0.637
Perceive to be qualified to advise parents and make recommendations about SIDS		-3.778	<0.001
Has direct experience of a case of SIDS		-1.115	0.265
Has children		-0.310	0.757
Has children aged 3 or less		-1.238	0.217

Source: The SIDS Project, Spanish survey.

An interesting aspect is that paediatricians themselves are quite accurate in qualifying their own knowledge about this topic. Those who consider themselves qualified to advise parents and make recommendations about SIDS and its risk factors have a level of knowledge which is, on average, almost 10 percentage points higher than the other paediatricians (75.7% against 66.2%, $p < 0.001$). More generally, the higher paediatricians perceive their confidence in discussing issues related to SIDS with newborns' parents (or, in a very

similar way, their knowledge about this topic) the greater their actual level of knowledge is.

Conversely, paediatricians' knowledge about SIDS risk factors was not influenced by having received a specific training course about SIDS, by the number of years that passed since the course, by their workplaces, by a direct experience of a case of SIDS, by having children or by having children aged 3 or less.

8.3.2. Factors influencing paediatricians' knowledge about the safest sleep position

In terms of knowledge about the best position in which to place infants to sleep, a surprising result is that having received a specific training course about SIDS has a negative effect (Table 8.4).

Table 8.4. Relationship between paediatricians' knowledge about the safest sleep position and the available covariates

	t-value (t-test)	Significance
Seniority	0.151	0.880
Years since latest training about SIDS	-0.702	0.484
Confidence in discussing issues related to SIDS with newborns' parents	3.297	0.001
Knowledge about SIDS and its risk factors	3.176	0.002
Has received specific training about SIDS	2.375	0.018
Workplace: CAP	-0.216	0.829
Workplace: Private clinic	1.399	0.163
Workplace: Private practice	0.019	0.985
Workplace: Public hospital	-0.398	0.691
Workplace: Private hospital	1.064	0.288
Perceive to be qualified to advise parents and make recommendations about SIDS	-0.832	0.413
Has direct experience of a case of SIDS	-0.399	0.690
Has children	1.018	0.309
Has children aged 3 or less	-0.347	0.729

Source: The SIDS Project, Spanish survey.

Those respondents who received a course on this topic, in fact, have a correct knowledge in only 51.1% of the cases, while for those who did not attend a course this percentage is of 61.7%. The reason that lies behind such a result was probably that mentioned earlier, specifically that those paediatricians who attended a course did so, on average, eight years ago, when the supine position was still not universally recognized as the best (and unique) in preventing SIDS.

In contrast to the situation about knowledge of the 13 risk factors for SIDS, in the case of knowledge of the best sleep position for infants the self-perception of being qualified to advise parents and make recommendations does not help identify those paediatricians with a higher level of knowledge. However, confidence in discussing issues related to SIDS with newborns' parents and the self-perception of one's knowledge on this topic are positively associated with knowledge of the safest sleep position. In both cases, self-assessment helps identify those paediatricians who have a correct knowledge about the safest sleep position.

Conversely, paediatricians' knowledge about the safest sleep position was not influenced by seniority, by the number of years that passed since the last training course about SIDS, by their workplaces, by a direct experience of a case of SIDS, by having children or by having children aged three years or less.

8.3.3. Factors influencing paediatricians' recommendations to parents about the position in which to place their infants to sleep

In the case of the recommendations that paediatricians give to parents about the position in which to place their infants to sleep, a key result shown in Table 8.5 is that those professionals who work in public hospitals are the ones who give, on average, more correct recommendations (64.7% vs. 56.4%), while those working in private clinics are the one who give fewest correct recommendations (46.9% vs. 60.8%). As happened in the case of knowledge of the safest sleep position, self-perception of being qualified to advise and make recommendations to parents is not significantly associated with giving correct recommendations, but the variables about the confidence in discussing these issues with parents and the self-perception of one's knowledge are. In both cases, self-assessment helps identify those paediatricians who give correct recommendations.

Table 8.5. Relationship between paediatricians' recommendations about the safest sleep position for infants and the available covariates

	t-value (t-test)	Significance
Seniority	0.709	0.479
Years since latest training about SIDS	-0.360	0.719
Confidence in discussing issues related to SIDS with newborns' parents	4.230	<0.001
Knowledge about SIDS and its risk factors	3.040	0.003
Has received specific training about SIDS	1.092	0.275
Workplace: CAP	0.919	0.359
Workplace: Private clinic	2.301	0.023
Workplace: Private practice	1.082	0.280
Workplace: Public hospital	-2.061	0.041
Workplace: Private hospital	1.119	0.267
Perceive to be qualified to advise parents and make recommendations about SIDS	-1.048	0.305
Has direct experience of a case of SIDS	-0.880	0.379
Has children	1.083	0.280
Has children aged 3 or less	-1.602	0.114

Source: The SIDS Project, Spanish survey.

Conversely, paediatricians' recommendations about the position in which to place infants to sleep were not influenced by seniority, by having received a specific training course about SIDS, by the number of years that passed since the course, by the other workplaces, by a direct experience of a case of SIDS, by having children or by having children aged three years or less.

8.4. Conclusions

Paediatricians reported discussing with parents issues about SIDS less often than it was expected. In fact, more than 50% of the respondents stated that they did so less often than once a week. However, it was somehow reassuring to notice that this percentage decreases to about 20% if we focus specifically on the recommendations about the infants sleep position.

Nevertheless, aside from any speculation about how often paediatricians discuss these issues with parents, what emerged to be a key finding is that

only 57.6% of respondents recognise the supine position as the safest position against SIDS and only a very similar percentage recommends exclusively the supine position to parents. In both cases, a significant proportion of respondents believe that the lateral position is also acceptable, but such a result is surprising as it comes from a highly qualified population as the paediatricians. The most immediate consequence of such behaviour is that a significant proportion of children are unnecessarily exposed to situations believed to be risky, and this is undesirable.

In terms of knowledge about the best position it emerged that, again surprisingly, those paediatricians who received a specific training about SIDS are more at risk of having incorrect knowledge, most likely because they received it when the supine position was still not universally recognized as the best (and unique) in preventing SIDS. In a fast-moving field such as SIDS prevention, in fact, training has to be updated regularly so as to ensure that it is delivering the latest research. Indeed, unless training is updated regularly, there is a danger that training might lull professionals into a false sense of security, making them feel that they do not need to keep up with new developments by reading the literature on the grounds that they attended a training course and so have been made aware of best practice. As a result, all paediatricians operating in the region should be involved in a specific training course about SIDS and its risk factors. This may not even be compulsory to attend, as paediatricians seem to be already aware of their degree of knowledge (high or low) so they may recognize an eventual need of an update.

Similar conclusions can be drawn in terms of the recommendations that paediatricians give to parents, even if, in this case, it emerged that those who work in public hospitals tend to give better recommendations than the others. Such a finding may be of help in the first phase of a process that aims at improving paediatricians' knowledge and recommendations on this topic. In fact, public hospitals could be explicitly chosen as the reference structure in terms of giving parents these recommendations (although precautions should also be taken in order to cover also the private sector).

In terms of overall knowledge of the SIDS prevention message, paediatricians answered correctly to an average 75% of the questions that they were asked. Specifically, seniority negatively influences this percentage, but such a result was expected as most of the risk factors have been discovered (or updated and changed) quite recently. Overall, paediatricians' knowledge about

the SIDS prevention message can be deemed to be satisfactory, but this does not mean that efforts should not be made to improve it, in particular with training courses that should target especially those paediatricians with higher seniority.

9. Cross country comparisons: a preliminary analysis

9.1. Introduction

In this chapter is presented a preliminary comparison between the three surveys that have been considered in this thesis, and whose characteristics are summarised in Table 9.1. Because of the differences that exist between these surveys (in the mode that was adopted, in the target populations and in the years when the surveys were run) it is necessary to be very careful when drawing any comparison between the data that were retrieved in the United Kingdom, Spain and Italy. In fact, it should represent more an indication than a result with any statistical significance. However, it is still very interesting to compare some of the most important descriptive statistics that illustrate the impact of the SIDS prevention message in these three realities. Before doing so, it may be worth emphasizing that the Italian survey was carried out between before the release of the 2011 AAP guidelines. Respondents from Italy, then, could refer only to the 2005 guidelines (Task Force on SIDS, 2005), which were less detailed than the 2011 ones.

Table 9.1. British, Spanish and Italian surveys' comparison

	British sample	Spanish sample	Italian sample
Year(s) of the survey	2012	2012-13	2008-09
Mode of the survey	Mail	Mail & Web	Paper & Pencil
Number of contacts with the respondents	3	4	1
Number of provinces/counties involved	7	3	7
Target population	GPs	Paediatricians	Paediatricians
Target population size	2,658	1,202	754
Sample size	824	1,202	754
Number of responses	349	552	418
Response rate	44.0%	45.9%	55.4%
Sector(s) involved	Public	Public & Private	Public

Source: GenitoriPiù national campaign (healthcare professionals' survey) and The SIDS Project (British and Spanish survey).

9.2. Demographic and professional background of the three different samples

From Table 9.2 it is possible to notice that in the Spanish and Italian samples women were slightly overrepresented, although, at least for the Spanish case, it should be mentioned that the sample frame itself was already unbalanced in this direction (females were 57.8%).

In all surveys less than 10% of the sample was aged 34 years or less. Moreover, while the British and Italian samples have about 25% of the respondents who were aged more than 54 years, this percentage for the Spanish sample is close to 50%. This could be the result of the shortfall of the Spanish sample frame mentioned in Section 3.7.2 (page 47), and some of the expected self-selection of the respondents can be observed (the percentage of persons aged over 54 years in the sample frame, in fact, was of 56%).

As a result, the Spanish sample also presents, on average, a higher seniority, with 50% of the respondents having at least 25.5 years of experience (versus 16 years in the United Kingdom and 20 years in Italy).

In terms of workplace, instead, almost 50% of the Spanish respondents have at least some involvement in the private healthcare sector, while the percentage of paediatricians working at least sometimes for the public sector is close to 85%. This involvement of the respondents in both the private and public sectors is confirmed by the average number of workplaces, which in Spain is close to 1.5, and the fact that about one every three physicians (30%) works in both sectors. Because of the structure of the respective healthcare systems (which heavily rely on the public sector for children' healthcare), the private sectors in the United Kingdom and in Italy were not included in the surveys. British and Italian respondents, however, seem less prone to work in more than one workplace than their Spanish colleagues (the average number of workplaces is 1.18 for the UK and 1.10 for Italy).

The percentage of non-UK citizens in the British survey is very similar to the percentage of respondents who were not born in Spain in the Spanish one (93.4%). In terms of country where the degree in medicine was obtained, instead, the percentage of respondents who did not earn it in the same country where the survey was carried out is much higher in the British sample (11.5%) than in the Spanish one (3.3%). Unfortunately none of the aforementioned variables was available for the Italian survey.

Table 9.2. Demographic and professional background of the three different samples (percentages)

Variable	Category	British sample	Spanish sample	Italian sample
Gender	Male	48.4	36.8	34.0
	Female	51.6	63.2	63.6
	Does not reply	-	-	2.4
Age	Less than 35	7.7	6.9	2.6
	35-44	28.7	14.0	11.7
	45-54	38.7	31.2	56.7
	More than 54	24.1	48.0	28.2
	Does not reply	0.9	-	0.7
Seniority	Less than 10	26.7	8.7	13.9
	10 – 19	29.5	17.9	33.0
	20-29	33.5	28.8	43.5
	More than 29	9.5	39.9	5.7
	Does not reply	0.9	4.7	3.8
Workplace (it was possible to give more than one response)	Public practice / CAP	100	60.7	73.2
	Public hospital		27.7	3.6
	Private practice		30.3	
	Private clinic		15.0	
	Private hospital		10.5	
	Birth centre			5.3
	Dept. of public health			9.1
	District			6.5
	Family planning clinic			4.1
	Vaccinations centre			6.9
	Other workplace			1.4
Sample fraction with a post-graduate degree in Paediatrics		0.26	1	1
Average number of workplaces (SE)		1.18 (0.02)	1.44 (0.03)	1.10 (0.02)
Citizenship (UK) or Country of birth (SPA)	Same country	93.4	93.5	
	Other	6.3	6.2	
Country of degree	Same country	88.5	96.7	
	Other	11.5	3.3	
Size of the city of the practice (UK) or of residence (SPA)	Less than 10k	28.1	12.3	
	10k – 30k	24.9	11.4	
	30k – 100k	23.2	14.5	
	100k – 500k	23.5	19.4	
	More than 500k	-	42.4	
Children	None	11.8	14.9	
	Aged less than 3	15.5	9.2	
	Aged more than 3	71.9	75.2	
	Does not reply	0.9	0.7	

Source: GenitoriPiù national campaign (healthcare professionals' survey) and The SIDS Project (British and Spanish survey).

The size of the city in which respondents lived and worked is not really comparable across the two surveys. In the British survey the address contained in the sample frame referred to the GP's practice (place of work), while in the Spanish survey it referred to the home of the paediatrician. In addition, the distribution of this variable is hardly comparable due to the presence of the city of Barcelona. The absence of such a big city in the region where the British survey was carried out, in fact, probably explains why the distribution of the respondents in the UK is much more oriented towards small villages.

Finally, an indirect effect of the older age of the Spanish sample is that there were fewer respondents with children aged 3 or less (only 9.2%). However, the percentages of respondents who did not have children at the time of the survey was similar in Spain to the one recorded in the United Kingdom (14.9% versus 11.8%).

9.3. Knowledge about the safest sleep position

In Table 9.3 it is possible to see the respondents' knowledge in terms of the safest position for SIDS prevention for the British and Spanish surveys. Unfortunately, this question (*'Do you know which sleep position(s) is/are associated with the lowest risk of SIDS?'*) was not included in the Italian questionnaire.

The difference that emerges between the two groups of respondents is quite striking. Table 9.3 shows that the BTS message has penetrated the British daily practice much more than the Spanish one (86.2% versus 57.6%). Moreover, it should not be forgotten that, while all the Spanish respondents hold a specialty in Paediatrics, only 26% of the British sample holds a Diploma in Child Health (or similar), a title which is even hardly comparable with a specialty. If we sum together the respondents who recommend the supine position exclusively and those who recommend the lateral position (alone or together with the supine one), though, these percentages become almost identical (93.4% in the United Kingdom and 93.3% in Spain). This indicates that although the Spanish prevention campaigns failed in introducing the exclusive recommendation of the supine position, they at least succeeded in discouraging the recommendation of the prone position (with an effectiveness which is similar to the British campaigns).

Table 9.3. Physicians' knowledge about the safest sleep position in the three different samples (percentages)

	British sample	Spanish sample
Supine exclusively	86.2	57.6
Lateral + Lateral and supine	7.2	35.7
Other positions	4.6	5.3
Does not know	1.4	0.4
Does not reply	0.6	1.1

Source: The SIDS Project, British and Spanish survey.

In any case, it should be pointed out that not even the results of the British survey can be defined completely satisfactory in terms of knowledge about the safest sleep position against SIDS. If we keep in mind that this is the strongest risk factor for SIDS and that the BTS message has been promoted for more than 20 years, we can see from Table 9.3 that 13.8% of GPs are still not aware of it, thus potentially transmitting to parents incorrect knowledge that may, consequently, expose children to unnecessary risky situations.

9.4. Knowledge about SIDS risk factors

Table 9.4 summarises the percentages of correct answers that were given to each risk factors in the three surveys. The British respondents seem to have received and adopted the BTS message well, but to be less knowledgeable (as expected) when it comes down to the less well publicised specific risk factors. Encouragingly, their performance is very good in the most important risk factors (sleeping position, maternal smoking and environmental smoking). For other risk factors it is variable, being quite good for the presence of soft object in the crib, breastfeeding and bed-sharing, but much less convincing with respect to overheating, firmness of the crib's mattress, room-sharing and offering a pacifier.

The Spanish respondents, instead, showed, overall, a better performance, with very good results in important risk factors (environmental smoking, maternal smoking, the presence of soft object in the crib and breastfeeding). On the negative side, their answers indicated little awareness about the latest information regarding room-sharing and bed-sharing, but, more seriously, it

was very surprising to notice that not even 90% of the respondents had been able to classify the supine position as a protective factor against SIDS. This clearly relates to what has been said in the previous section, and it is a very serious criticality, as the BTS message has been tirelessly promoted for more than two decades, and its effectiveness and importance have been widely proven.

Table 9.4. Physicians' evaluation of the effect that different behaviours have on the risk of SIDS in the three different samples (percentages of correct answers)

	British sample	Spanish sample	Italian sample
Smoking (maternal and paternal) in the infants' environment	96.8	96.9	95.0
Placing infants for sleep in a supine position	91.7	89.0	98.6
Breastfeeding	73.3	82.6	78.5
Performing an electrocardiogram (ECG) on the infant	70.1	83.0	68.7
Keeping the bedroom temperature [below 20° C/high]	64.4	50.4	94.5
Using a [soft/hard] crib mattress	49.7	58.0	83.3
Make the infants' feet reach the foot of the crib	10.9	48.9	34.7
Maternal smoking during pregnancy	96.3	92.0	
Allowing infants to sleep in the same bed as their parents	84.5	73.2	
Placing soft objects (pillows, quilts, or stuffed toys) in the crib	75.0	91.5	
Sleeping with an infant on a couch/armchair	68.7	66.7	
Allowing infants to sleep in the same room as their parents	52.6	31.0	
Tummy time when the infant is awake and observed	43.4	69.8	
Offering infants a pacifier at nap time and bedtime	26.2	47.8	
Placing infants for sleep in a prone position		92.8	

Source: GenitoriPiù national campaign (healthcare professionals' survey) and The SIDS Project (British and Spanish survey).

Finally, despite the fact that the Italian survey was carried out before the 2011 guidelines, it is interesting to notice that Italian paediatricians performed better than the other respondents in 3 out of the 7 risk factors that they were asked (sleep position, bedroom temperature and firmness of the crib's mattress). In particular, their performance is also quite good in terms of environmental smoking and breastfeeding (especially if we consider that

breastfeeding was clearly defined as a SIDS risk factor only in 2009), while it is somehow low when we consider the confounder items about the ECG and making the infants' feet reach the foot of the crib.

Table 9.5, instead, shows how the proportion of correct answers given by the different groups of respondents varied across surveys. This indicator is less reliable for the Italian sample as the number of items included in their questionnaire was quite low. In any case, it confirms the impression given by Table 9.4 that the Spanish respondents performed better than the British ones.

Table 9.5. Proportion of correct answers given by the respondents about the different risk factors for SIDS

	Mean	Std. error	95% CI	Number of items
British sample	0.65	0.009	(0.64 - 0.67)	14
Spanish sample	0.74	0.006	(0.73 - 0.75)	15
Italian sample	0.82	0.007	(0.81 - 0.84)	7

Source: GenitoriPiù national campaign (healthcare professionals' survey) and The SIDS Project (British and Spanish survey).

The difference in the number of items between the British survey and the Spanish one is due to the problem mentioned in Section 3.5.1 (page 43). The British version of the questionnaire, in fact, included the risk factor '*placing infants for sleep in a lateral position*' (instead of '*placing infants for sleep in a prone position*'), which could have confused the respondents, and it was thus excluded from the analysis. However, it is worth underlining that this operation does not affect in any way the discussion reported in Section 9.3 and the data presented in Table 9.3.

9.5. Recommendations about the infants' sleep position

Table 9.6 confirms a result which was expected, which is that the British GPs discuss these issues with newborns' parents less than the paediatricians (both Spanish and Italian) do. However, it also confirms that GPs should be rightly considered part of the healthcare professionals that need to be involved in the SIDS prevention campaigns. In fact, more than 60% of the respondents stated that they discussed these issues with parents, and 3.4% of them discuss

these issues at least once a week. This percentage is obviously higher for paediatricians (73.2% in Spain and 79.2% in Italy) because, within their healthcare systems, they are one of the most important subjects in charge of delivering the SIDS prevention message to newborns' parents.

Table 9.6. Physicians' propensity to give recommendations about the infants sleep position to parents in the three different samples

	British sample	Spanish sample	Italian sample
Yes	60.6	98.6	98.1
No	38.8	1.1	0.2
Does not reply	0.6	0.4	1.7

Source: GenitoriPiù national campaign (healthcare professionals' survey) and The SIDS Project (British and Spanish survey).

Table 9.7 specifies the kind of recommendations given by the respondents (among those that do discuss these issues with parents). Surprisingly, British GPs are the group that gives the best recommendations, with more than 90% of respondents recommending exclusively the supine position. This is a very good result, especially if we consider that GPs in the United Kingdom are not deemed to be among the most important healthcare professionals in charge of delivering the BTS message to parents. In Spain and Italy, instead, paediatricians are the most important figure in terms of delivering such message, but their performance is unexpectedly quite poor. If we look at the Spanish respondents, this is clearly due to a frequent recommendation of the lateral position as well (or alone), although it has been widely demonstrated that it is much riskier than the supine position. This result is even more remarkable if we consider that the Spanish survey was carried out in 2012-2013, which is after the lateral position was definitely placed out of favour by the latest changes to the guidelines. In the case of Italy, Table 9.7 shows a high percentage of paediatricians who did not reply to this question. This fact could not be explained at the time, but, even if most of the nonrespondents were to choose the supine exclusively option, the percentage of paediatricians recommending exclusively the supine position would still be low (around 85%).

Table 9.7. Physicians' recommendations to parents about the sleep position in the three different samples (figures among those who give recommendations to parents)

	British sample (n=213)	Spanish sample (n=546)	Italian sample (n=417)
Supine exclusively	90.6	58.1	68.8
Lateral + Lateral and supine	2.4	37.0	11.8
Other positions	2.4	3.7	1.2
Does not recommend a specific position	1.9	0.2	1.2
Does not reply	2.8	1.1	17.0

Source: GenitoriPiù national campaign (healthcare professionals' survey) and The SIDS Project (British and Spanish survey).

9.6. Discussion

The BTS message seems to have been effectively adopted by the British GPs, but, surprisingly, not by the Spanish and, to a lesser extent, Italian paediatricians. The percentage of healthcare professionals aware that the supine position is the safest against SIDS is much higher in the United Kingdom than in Spain, despite the fact that the Spanish paediatricians should be much more qualified for these issues than the British GPs. Consequently, the recommendations that British GPs give to parents about the infants' sleep position are also quite good, and thus avoid exposing children to unnecessary risky situations. However, at the moment the British healthcare system does not take advantage of this knowledge as only 3.4% of the GPs stated that they discussed these issues with parents at least once a week, while almost 40% never do so. As a consequence, British policymakers could reconsider the role of GPs in terms of delivering parents the BTS message, as they were revealed to be quite prepared about this topic. In Spain and Italy, instead, the results of the surveys confirmed that paediatricians have a crucial role in transmitting the BTS message to parents as they discuss these issues very often. However, the results in terms of knowledge and of recommendations given about the safest sleep position cannot be deemed satisfactory. In both cases, less than 70% of the respondents recommend exclusively the supine position, and in the Spanish case less than 60% is aware that the supine position alone is the safest against SIDS. The reason that may be lying behind such a poor performance

could be that, although the prevention campaigns succeeded in discouraging the recommendation of the prone position, they failed in introducing the exclusive recommendation of the supine position, with a high percentage of paediatricians still convinced that the lateral position is acceptable.

Alternatively, this could be just due to a slower transmission of new knowledge in Spain than in Britain. Research definitely showing that the lateral position is not significantly different from the prone position is quite recent, and, previous to that, the lateral position was regarded as better than the prone. Moreover, most research is published in English and in Anglo-Saxon journals, and this may constitute an obstacle for its quick and effective transmission in a Spanish speaking environment. In any case, it is quite surprising to see that the BTS message has not yet been widely received by highly qualified healthcare professionals such as paediatricians, and policymakers should find a solution as soon as possible. In particular, Spanish policymakers should urgently intervene in order to clarify to their paediatricians that the supine position is the only one that can be deemed to be a protective factor against SIDS. Both in the United Kingdom and in Italy it has been shown that specific training campaigns for healthcare professionals significantly increase the degree of their knowledge and recommendation, so this could be the first choice for policymakers to try to improve the situation.

Apart from the sleep position, the SIDS prevention message as a whole seems to have been better received by Spanish and Italian paediatricians. As it may be defined as a more specialised knowledge, it was expectable that paediatricians would have given a better performance because of their active role and responsibility in delivering this message to parents. Spanish respondents showed the overall better awareness in terms of the different SIDS risk factors, with especially good results in terms of the most important risk factors (environmental smoking, maternal smoking, the presence of soft object in the crib and breastfeeding). Italian respondents also gave an overall good performance, while British respondents did well for some important risk factors but also performed less well for other important risk factors (such as overheating, firmness of the crib's mattress, room-sharing and offering a pacifier).

9.7. Conclusions

This chapter has presented a preliminary cross country comparison between the three surveys that have been considered in this thesis. Despite its straightforwardness, it already provides some interesting insights about the behaviour of some healthcare professionals who are responsible for effectively delivering to parents the BTS message and the whole SIDS prevention message (see Section 9.6). It is important to underline the preliminary nature of the results of the analyses, and their interpretation should be taken cautiously, insofar as it serves more as an indication.

Nevertheless, policymakers may find useful to see the results that were achieved by different healthcare systems and policies, and, if they want to, they may use this information to their advantage for strengthening their healthcare systems and correcting eventual weaknesses.

10. Conclusions

10.1. Testing the research hypotheses

In Chapter 1 readers were presented with the five research hypotheses underlying this study, while in the most recent chapters they were introduced to the analysis of the data resulting from the three different surveys. Now, it is time to verify whether the research hypotheses hold or not in all, or in some, of the three different countries that were considered in this research.

10.1.1. The first research hypothesis

'The healthcare professionals' training process slowly adapts itself to the rate of change of scientific knowledge, not providing training as frequently, or in a sufficiently timely fashion, as it should because its infrastructure may not allow sufficient flexibility for this to be achieved. As a consequence, healthcare professionals do not necessarily receive training soon after major changes in clinical practice are introduced, or major new breakthroughs in research announced'

Data to test this hypothesis refers only to the United Kingdom and Spain. In both cases, a substantial percentage of about 60% of the healthcare professionals that were surveyed declared to have never received specific training about SIDS (60.2% and 64.4% respectively). Of those who received specific training, many of them last received training before 2005. In the United Kingdom, where the target population was less specialized in paediatrics and child health, this percentage was of about 65%, while in Spain, where the surveyed population was composed of highly specialised respondents, it was around 44%. Overall then, only about 12% of the British respondents and 20% of the Spanish ones had received a specific training course about SIDS since 2005.

As a result, the first research hypothesis holds, and both the British and the Spanish healthcare systems should improve their training processes by providing more frequent training in order to ensure professionals keep up with

the latest scientific evidence. In such a fast-moving field, they should also ensure that the contents of the trainings are in line with the latest changes.

10.1.2. The second research hypothesis

'Healthcare professionals' knowledge and behaviour are not up to date with the latest scientific evidence. As a consequence, healthcare professionals whose last training on a specific topic is further from the present time will show worse knowledge and behaviour than those healthcare professionals who more recently received training'

As was the case for the first hypothesis, data to test this hypothesis refers only to the United Kingdom and Spain. In this case, however, the results are quite different in the two countries. In Spain, in fact, there is no significant correlation between the year of the latest training course about SIDS and the respondents' knowledge and behaviour about SIDS and its risk factors (p s equal to 0.484 and 0.719 respectively). In the United Kingdom, instead, these correlations are significant (with p s varying between 0.21 and 0.41).

As a result, the second research hypothesis holds only for the United Kingdom. The fact that it does not hold for the Spanish paediatricians can be explained by the fact that this population is more likely to be exposed to these problems than the British GPs are. In fact, while paediatricians spend their whole professional lives involved with children's health problems, British GPs cover the whole age range, and may not encounter child health issues so frequently. This specialisation could drive paediatricians to keep their knowledge updated autonomously if they are not provided with '*official*' training courses. Many Spanish respondents, in fact, stated in the comments section of the questionnaires that they keep updated their knowledge by reading the scientific literature in these topics. In the case of British GPs, instead, SIDS may be only one of many topics that they need to keep themselves updated with, thus '*official*' training courses could be the only occasion for them to get in touch with the latest scientific evidence.

10.1.3. The third research hypothesis

'Healthcare professionals' knowledge and behaviour on a specific topic are not uniformly distributed across different generations, because the courses that they attended about this topic changed their content as epidemiological research advanced'

In this case, data to test this hypothesis refers to all the three countries that have been considered in this research. In all of them, age does not influence the recommendations that healthcare professionals give to newborns' parents, but it is significantly correlated with healthcare professionals' knowledge about SIDS and its risk factors. However, while this correlation is negative (as expected) in the United Kingdom and in Spain (ρ s equal to -0.29 and -0.13 and p s equal to 0.001 and 0.002 respectively), it is positive in Italy ($\rho=0.12$, $p=0.013$). This can suggest that in Italy the attention to SIDS and its risk factors declined over time (and the training process on this topic became weaker) or that older paediatricians are more aware of their responsibility in giving parents the right advice on this topic and thus keep themselves more updated.

As a result, the third research hypothesis holds only for the British and Spanish realities, while it does not hold for Italy. Italian policymakers should meditate about such an outcome and try to increase the awareness of this problem among younger paediatricians. Besides, they should try to understand whether their poor performance may be the result of a lack of higher education courses on this topic or of a lack of effectiveness of the existent courses.

10.1.4. The fourth research hypothesis

'Healthcare professionals who completed further additional training in paediatrics and child health have an overall better knowledge and behaviour about SIDS and its risk factors'.

Data to test this hypothesis refers only to the United Kingdom, because all respondents from Spain and Italy held a specialty in paediatrics. In the United Kingdom, however, only 26% of the respondents held such a degree, but, surprisingly, this had no positive effect neither on the overall knowledge about SIDS or on the GPs' recommendations to parents. This lack of influence on the respondents' knowledge persisted if the items about SIDS risk factors were

considered one by one (with only a slightly significant effect for the item about bed-sharing).

As a result, the fourth research hypothesis does not hold for the United Kingdom. This is surprising, especially if we consider that the most common post-graduate titles in paediatrics, the Diploma in Child Health and the Membership of the Royal College of Paediatrics and Child Health, explicitly require in their syllabus that '*The candidate must [...] Know the role of health promotion programmes, for example, [...] sudden infant death*'. British policymakers should then reconsider the structure of these programmes and insure that SIDS is given the proper attention within these specialties.

10.1.5. The fifth research hypothesis

'Healthcare professionals who have a better knowledge about SIDS and its risk factors also have better behaviours about this topic (especially in terms of recommendations given to parents)'

In this case, data to test this hypothesis refers to the United Kingdom, Spain and Italy. In all of them, the degree of knowledge about SIDS risk factors heavily influences the correctness of the recommendations that healthcare professionals give to newborns' parents.

As a result, the fifth research hypothesis holds in all countries, and shows that an effective way to potentially reduce the risk of SIDS in the population (by recommending parents to put their babies to sleep on their back) is to increase the awareness about this topic among the healthcare professionals in charge of delivering the Back-to-Sleep message.

10.2. Limitations of the study

The limitations of this study can relate either to each of the surveys or to the cross country comparisons.

Each survey presented an overall response rate which was below 60%. Despite such response rates being higher than those achieved by most of the studies that were carried out about this topic, an analysis of nonresponse should be performed for each of the surveys in order to insure that the results are not biased by such a consistent percentage of nonrespondents. Such a step would allow the identification of the response mechanism that was followed by

the target population and to account for it properly. Given the high numbers of respondents, however, so far it has implicitly been assumed that the response mechanisms of the three surveys follow a '*missing completely at random*' (MCAR) distribution. Such an assumption implies that the population of respondents does not statistically differ from the population of nonrespondents, and it can be thus assumed to be representative of the whole target population. A preliminary analysis of the response mechanism has been carried out for the British survey, and it seems to suggest that the MCAR assumption does not hold. However, it also suggests that a '*missing at random*' (MAR) assumption could describe well the response mechanism to the survey by accounting for gender and age, and this would not delegitimise the results that have been presented so far. For the Spanish survey, instead, such an analysis would have a different importance, because, as mentioned earlier, it was known that the Spanish sample frame was unbalanced towards certain groups of respondents. However, it was also expected that the less represented groups would have had a higher propensity to reply, thus making a comparison between the population of respondents and the '*real*' target population quite complex. In any case, a more thorough analysis of the response mechanisms in both surveys needs to be carried out. In the case of the Italian survey such an analysis cannot be performed because there was no sample frame available prior to the implementation of the survey and the participation of the healthcare professionals was on a voluntary basis.

The British and the Spanish surveys, those that were implemented explicitly for this PhD project, did not make use of a *token of appreciation* that could have helped increasing the response rate. Considering the typology of the target populations, the most effective token would have been a cheque included in one or more mailings, but such an option was not possible due to budget constraints. The British survey's response rate would have probably benefitted by the possibility to send a third reminder as was done for the Spanish survey. Considering the increasingly high use of the Internet that characterises GPs and the way that mail is handled within each GP's practice, such an option would have helped reaching more GPs. Moreover, if the list of the email addresses had been available both for the British and the Spanish survey, it would have been possible to send sample members an introductory email in order to present the survey before the first mailing was sent. Such a precaution, in fact, has been proven to be an effective strategy to improve the

response rate of a survey. This option was not adopted in the Spanish survey alone in order not to lose comparability with the British survey (and also because the email address was not available for all sample members).

In more detail, the British survey might have been affected by the fact that the sample frame was retrieved through the website of the NHS about 17 months before the survey started. This could have been the source of some bias, especially in terms of retired physicians and newly employed ones, but it was not possible to take any action in order to prevent it or reduce it. Moreover, as mentioned earlier, one of the items that was included in the questionnaire (the one about the lateral position – Appendix 2: Questionnaire – UK, page 151) had to be dropped from the analysis because from the responses that were received it was clear that some respondents had been confused by it. Question 12 seems to have been misread by some respondents, but in this case it was decided to leave it in the analysis as it was because the wording had been carefully chosen to be as clear as possible. In question 14 some respondents pointed out that they gave recommendations to parents less often than '*about once a month*', so it is possible that others chose '*about once a month*' but meant with that '*less than about once a month*'. In question 17, finally, some respondents pointed out that there was not an '*I do not remember*' option, but this had been expressly planned when the questionnaire was drafted in order to encourage respondents to make an effort for remembering the year of their latest training course about SIDS.

The Spanish survey might have been affected by two typographical errors that occurred when the questionnaire was translated into Catalan. In question 15, because of space constraints, the option '*Never received any training*' was translated with '*Mai he rebut cap formació*'. This translation is correct, but, because of the way the question was formulated, could mean that the respondents had never received any '*training*' about SIDS, rather than any '*training course*' about SIDS. The item about the firmness of the crib's mattress, instead, saw the word '*mattress*' translated into '*coixí*', which means '*pillow*'. In order to correct for these problems, these errors were corrected in the questionnaire that was sent in the third mailing and in the web questionnaire. Moreover, a corrective questionnaire (including only the corrected version of the abovementioned questions) was sent via email to all those respondents who gave their consent to use their email address to contact them. In order to clarify the concerns that were noticed in the British

questionnaire, the item referring to the '*lateral position*' was changed into '*prone position*', while the word '*lowest*' was underlined in question 12 (question 10 in the Spanish questionnaire).

The Italian survey was not based on a sample frame that was known *a priori*, thus making it not possible to use either a probability sample (as for the British survey) or a census approach (as for the Spanish survey). Moreover, it was focused on the whole country and was constrained by the decisions of the policymakers involved in the campaign. Some risk factors were deemed important and included in the survey despite being still debated by the scientific community, while other recognised risk factors were excluded. As a consequence, the findings of this study may not apply, without appropriate adjustments, to populations whose policymakers do not share the same point of view of their Italian homologues. Moreover, some healthcare professionals might not necessarily have given the wrong answer out of ignorance but rather because they are aware of current issues surrounding SIDS risk reduction messages. As a consequence, they could have felt confused when asked to choose an answer without the possibility of giving further explanations, possibly accounting for a further source of bias.

The cross country comparisons need to be considered with caution because of all the differences that exist between these surveys. Moreover, although the British and the Spanish surveys were carried out with similar procedures, this is not true for the Italian survey. As a consequence, when all the three countries are included in the comparisons, these comparisons represent more an indication than a result with any statistical significance.

10.3. Further developments

This thesis left some points open for future analysis, such as trying to understand why GPs who work in a single practice possess a higher knowledge on this topic than their colleagues working in two practices or more (Section 7.4.1, page 108) or expanding the sample selection model one step further in order to include in the model the information provided by the survey response mechanism (Section 7.3.4, page 112).

It was also possible to notice that, despite the importance of the healthcare professionals' role, in the literature there are not many studies that investigated their knowledge about SIDS and its risk factors. Further efforts are

needed to understand the relationship between healthcare professionals' awareness of the risks of different sleeping positions and their decisions to recommend certain sleeping positions over others.

Moreover, it would be very interesting to gather more recent data from the United States in order to draw a comparison with the European situation, and further contributions are much needed also concerning knowledge about this topic in the United Kingdom, notably among other classes of healthcare professionals who have frequent contact with the parents of newborn children, such as midwives and health visitors.

Finally, it would be very interesting to see whether the conclusions that were drawn in this thesis also apply to other regions of the countries that were analysed.

Appendices

Appendix 1: Cover letter - UK



The SIDS Project
School of Social Sciences

28 May 2012

Dear Doctor [surname],

I am writing on behalf of the SIDS Project to ask for your help. The SIDS Project is a comparative study of knowledge among doctors about the prevention of Sudden Infant Death Syndrome (SIDS) run by the University of Southampton. A similar survey has already been carried out in Italy, and we are also ready to replicate this same study in Spain, in collaboration with the Col·legi Oficial de Metges de Barcelona.

As you will know, SIDS (also known as 'cot death' or 'crib death') is one of the major causes of death among infants in developed countries. To date it is impossible to eliminate the risk of SIDS, but particular attention has been given to the identification of behaviours that may reduce the risk. Research into SIDS risk factors has led to changes over the last 10 years in guidance as to best practice. The main aim of the SIDS Project is to understand the extent to which new knowledge is transmitted to those in charge of delivering advice to parents of newborns. This is something which no-one has so far attempted to investigate in the UK. The way we have chosen to learn about the effectiveness of this process is by asking GPs directly.

You are among a small number of GPs that have been randomly selected to participate in this study. For this reason, we would greatly appreciate your help. Your responses are voluntary and will be kept confidential. As soon as the mailing operations will come to an end your name will be deleted from our files, and your answers will never be associated with it.

The questionnaire consists of 20 questions, and it should take less than 5 minutes to complete. With this letter we have included a pre-addressed and pre-stamped envelope which we hope that will minimize the efforts on your side. If you have any questions about this study please contact us at sidsproject@soton.ac.uk or write to us at: The SIDS Project, School of Social Sciences, University of Southampton, Southampton SO17 1BJ.

As you will see, some of the questions concern your knowledge of factors influencing the risk of SIDS. We would really appreciate if you could answer these questions freely and sincerely, as these will be our most important tool for evaluating the effectiveness of the training that GPs receive about this topic. The SIDS Project has been reviewed and approved by both the Ethics Committee and the Research Governance Office of the University of Southampton (Project ID: 1197).

By taking a few minutes to share your knowledge and opinions about SIDS you will be helping us a great deal, and, if you wish, we should be glad to keep you up-to-date with the results of this study.

We hope you enjoy completing the questionnaire and look forward to receiving your response.


Many thanks,

A handwritten signature in dark ink, appearing to read 'Federico de Luca'.

— Federico de Luca

SIDS Project Coordinator

Appendix 2: Questionnaire - UK



UNIVERSITY OF
Southampton

Preventing SIDS: a comparative study of Primary
care in the United Kingdom, Spain and Italy

1 What is your gender?

☐ Female
☐ Male

2 What is your year of birth?

3 For how many years have you been practising as a General Practitioner?

year(s)

4 Did you do a paediatrics and child health post/ placement as part of your clinical training?

☐ Yes
☐ No

5 Do you hold a post-graduate qualification in paediatrics and child health?

☐ Yes (If so, which?)
☐ No

6 What is your citizenship?

☐ United Kingdom
☐ Other country of the European Union (E.U.)
☐ Other country outside of the E.U.

7 Where did you obtain your degree?

☐ United Kingdom
☐ Other country of the European Union (E.U.)
☐ Other country outside of the E.U.

8 Have you ever heard of Sudden Infant Death Syndrome (SIDS), also known as "cot/crib death"?

☐ Yes
☐ No → Go to (question) 19

9 Have you ever had any direct experience of a case of SIDS?

☐ Yes
☐ No

10 How would you rate your confidence in discussing issues related to SIDS with newborns' parents?

☐ Very high
☐ Somewhat high
☐ Average
☐ Somewhat low
☐ Very low

11 How would you rate your knowledge about SIDS and its risk factors?

☐ Very high
☐ Somewhat high
☐ Average
☐ Somewhat low
☐ Very low

12 Do you know which of the following sleep positions is/are associated with the lowest risk of SIDS?
You can select more than one answer

☐ Lateral
☐ Prone
☐ Supine
☐ I do not know

13 What effects do you believe that the following behaviours have on the risk of SIDS?
Please tick the effect that applies per each behaviour

	It increases the risk of SIDS (↑)	It lowers the risk of SIDS (↓)	It does not affect the risk of SIDS (=)	I do not know (?)
Placing infants for sleep in a supine position	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Offering infants a pacifier at nap time and bedtime	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Using a soft crib mattress	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Allowing infants to sleep in the same bed as her/his parents	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Encouraging tummy time when the infant is awake and observed	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Making up the bedding so that the infant's feet reach the foot of the crib	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Maternal smoking during pregnancy	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)

(Continues...) What effects do you believe that the following behaviours have on the risk of SIDS? <i>Please tick the effect that applies per each behaviour</i>	It increases the risk of SIDS (↑)	It lowers the risk of SIDS (↓)	It does not affect the risk of SIDS (=)	I do not know (?)
Allowing infants to sleep in the same room as her/his parents	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Placing infants for sleep in a side position	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Breastfeeding	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Performing an electrocardiogram (ECG) on the infant	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Placing soft objects such as pillows, quilts and stuffed toys in the crib	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Keeping the bedroom temperature below 20° C	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Smoking (both maternal and paternal) in the infant's environment	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Sleeping with an infant on a couch / armchair	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)

14 How often do you talk with parents of infants about the correct sleep position they should put their children in?

☐ More than once a week

☐ About once a week

☐ Two or three times a month

☐ About once a month

☐ Never → *Go to (question) 16*

15 Which position do you usually recommend?

You can select more than one answer

☐ Lateral

☐ Prone

☐ Supine

☐ I do not recommend a particular position

16 Do you perceive yourself as being qualified for giving advice and recommendations about SIDS and its risk factors to parents?

☐ Yes

☐ No

17 Could you tell us the year in which you received the most recent training about SIDS?

☐ Never received any training → *Go to (question) 19*

18 Are you satisfied or unsatisfied of your most recent training about SIDS?

☐ Satisfied

☐ Neither satisfied nor unsatisfied

☐ Unsatisfied

19 Do you have any children (any age)?

☐ Yes

☐ No → *Skip question 20*

20 Do you have any children who are currently under the age of 3?

☐ Yes

☐ No

If you would like to be kept updated with all the findings resulting from this research, please give us your email address

@

If you would like to give us your opinion about this survey, or if there is anything else you would like to let us know, you can use the following space:

**We really appreciate your help,
Thank you very much!**

For any doubt you can contact Mr Federico de Luca at sidsproject@soton.ac.uk, or write to him at:
The SIDS Project, School of Social Sciences, University of Southampton, Southampton SO17 1BJ, UK

Questionnaire code
R50K02

Appendix 3: Postcard reminder - UK

12 June 2012

Dear Doctor [surname],

On May 28th we sent you a questionnaire to ask for your help in The SIDS Project, a comparative study of knowledge among doctors about the prevention of SIDS.

If you are among the many participants who have already completed and returned the questionnaire, we should like to sincerely thank you for helping us out.

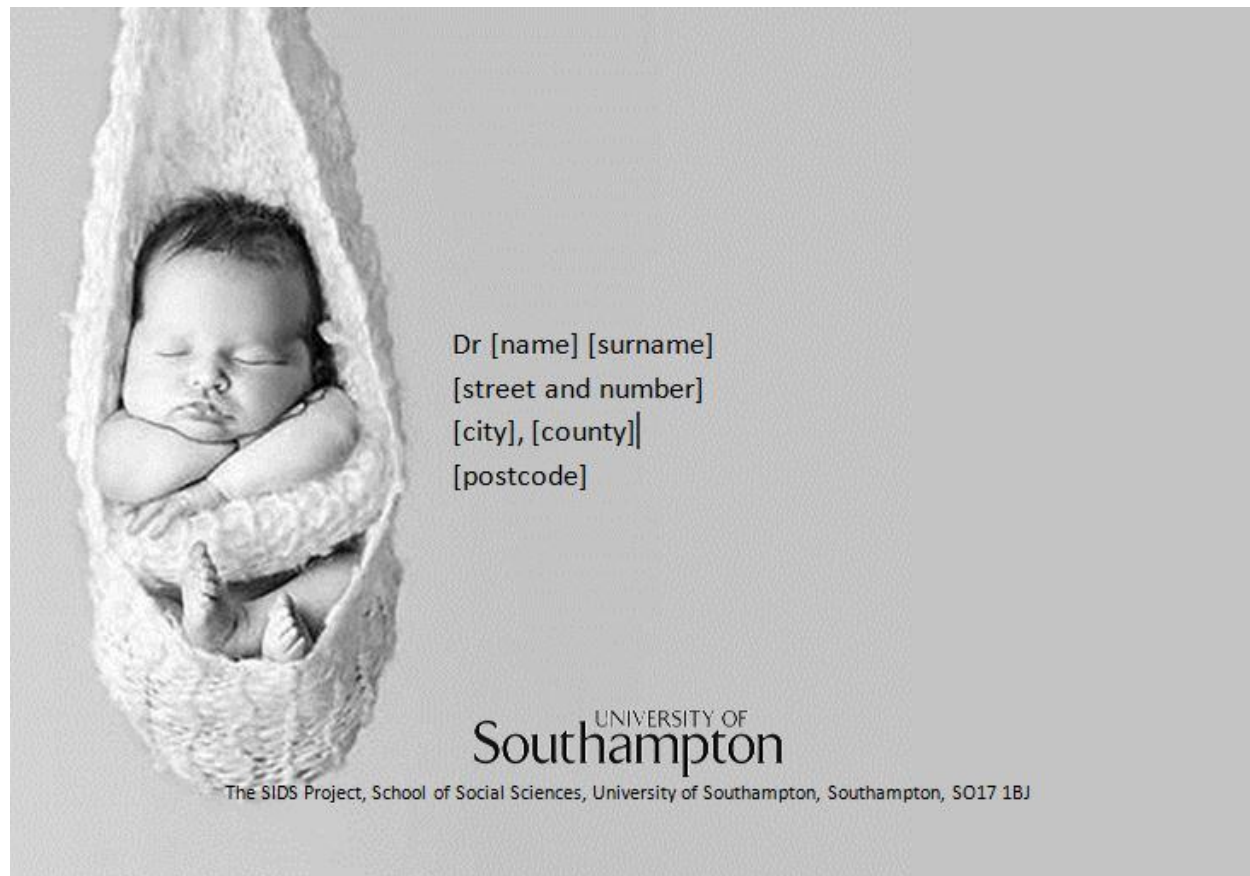
However, if you still have not completed it, we should be especially grateful if you could do so as soon as possible. In fact, to achieve accurate results, it is extremely important for us to receive an answer from all the participants.

If you did not receive a questionnaire, or if it was misplaced, please contact us at sidsproject@soton.ac.uk or at the address in the front of the postcard, and we shall send you another one as soon as we receive your message.

Sincerely,



Federico de Luca
SIDS Project Coordinator



Appendix 4: Follow-up letter - UK



The SIDS Project
School of Social Sciences

25 June 2012

Dear Doctor [surname],

I am writing to you as I wanted to give you a final opportunity to become involved in the SIDS Project. As mentioned in my earlier letter, the SIDS project aims at drawing the first comparisons across Europe about how new knowledge regarding Sudden Infant Death Syndrome risk factors is transmitted to those in charge of delivering advice to the parents of newborns. A similar survey has already been carried out in Italy, and we are ready to replicate the study in Spain, in collaboration with the Col·legi Oficial de Metges de Barcelona. However, although the response rate achieved in the Italian survey was around 60%, so far the English equivalent struggles to reach 35%.

To the best of our knowledge, the questionnaire that was enclosed with our first letter has not yet been returned, and I am thus writing again because of the importance of your response for helping us obtain accurate results. It is only by hearing from every person that we selected that we can be sure that the results truly represent GPs in your area. Therefore, we would really appreciate if you could fill in the questionnaire soon. Please note that the final deadline for sending it back to us is **9 July 2012**.

In case the original copy of the questionnaire has been lost, we have attached to this letter another copy and a pre-addressed and pre-stamped envelope to return it. The questionnaire consists of 20 questions, and it should take less than 5 minutes to complete. Your responses are voluntary and will be kept confidential. As soon as the mailing operations come to an end your name will be deleted from our files, and your answers will never be associated with it. If you have any questions about this study please contact us at sidsproject@soton.ac.uk or write to us at: The SIDS Project, School of Social Sciences, University of Southampton, Southampton SO17 1BJ.

As you may notice, some of the questions concern your knowledge of factors influencing the risk of SIDS. We would really appreciate if you could answer these questions freely and sincerely, as these will be our most important tool for evaluating the effectiveness of the training that GPs receive about this topic. The SIDS Project has been reviewed and approved by both the Ethics Committee and the Research Governance Office of the University of Southampton (Project ID: 1197).

By taking a few minutes to share your knowledge and opinions about SIDS you will be helping us a great deal, and, if you wish, we should be glad to keep you up to date with the results of the study.

We hope you enjoy completing the questionnaire and look forward to receiving your response.

Many thanks,

A handwritten signature in dark ink, appearing to read 'Federico de Luca'.

Federico de Luca

SIDS Project Coordinator

Appendix 5: Cover letter - Spain



Barcelona, 5 de Novembre 2012

Estimado Doctor [surname],

Desde el Consejo de Colegios de Médicos de Cataluña nos complace hacerle participe de nuestra colaboración en el proyecto internacional SIDS (Sudden Infant Death Syndrome), del Departamento de Estadística Social de la Universidad de Southampton (Reino Unido) y con el apoyo del Departamento de Sociología de la Universitat de Barcelona, convencidos de su importancia para nuestro colectivo.

Dado que el SMSL (Síndrome de Muerte Súbita del Lactante) es una de las causas más importantes de la muerte de bebés en los países desarrollados, y que a fecha de hoy es imposible eliminar el riesgo de padecerlo, en los últimos 10 años se han realizado notables esfuerzos en la identificación de pautas que podrían reducirlo. El conocimiento derivado de esta investigación ha conllevado a mejoras sustanciales en la prevención del Síndrome y el objetivo principal del SIDS Project es explorar el acceso a este nuevo conocimiento por parte de los profesionales encargados de aconsejar a los padres de los neonatos.

El SIDS Project es un estudio comparativo de la difusión de los conocimientos sobre la prevención del SMSL, que se está llevando a cabo en Cataluña, Italia y Reino Unido. Para conocer la efectividad de este proceso de aprendizaje nos ha parecido la mejor opción preguntar directamente a los pediatras mediante un breve cuestionario de 18 preguntas que no le llevará más de 5 minutos completar.

La encuesta está relacionada con los factores que influyen en el riesgo de padecer SMSL y ha sido revisada por la Sociedad Catalana de Pediatría. Le agradeceríamos que contestara a estas preguntas de forma libre y sincera, ya que sus respuestas serán la herramienta más importante para evaluar la eficacia de la formación sobre este tema y promover mejoras al respecto.

Le agradecemos su ayuda dado que usted se halla entre un pequeño número de pediatras seleccionados aleatoriamente para participar en este estudio. Sus respuestas son voluntarias y permanecerán confidenciales. Tan pronto como los envíos acaben, eliminaremos su nombre de nuestros archivos y sus respuestas nunca serán asociadas con él. El SIDS Project ha sido revisado y aprobado por el Comité Ético y la Oficina Gubernamental de Investigación de la Universidad de Southampton.

En esta carta hemos incluido un sobre franqueado que esperamos minimice cualquier molestia. Si tiene alguna duda sobre este estudio, o si prefiere que le mandemos la encuesta en castellano, por favor contacte con nosotros en la dirección '*The SIDS Project, Área de Praxis, P. de la Bonanova 47, 08017, Barcelona*' o bien en el correo electrónico sidsproject@comb.cat.

Compartiendo su conocimiento sobre el SMSL nos ayudará enormemente, y estaremos encantados de informarle de los resultados del estudio.

Quedamos a la espera de su respuesta y aprovechamos la ocasión para enviarle un cordial saludo.

Dr. Josep Arimany Manso
Director de l'Àrea de Praxis

Sr. Federico de Luca
Coordinador del SIDS Project



Barcelona, 5 de novembre 2012

Benvolgut Dr. [surname],

Des del Consell de Col·legis de Metges de Catalunya ens complau fer-lo partícip de la nostra col·laboració en el projecte internacional SIDS (Sudden Infant Death Syndrome), del Departament d'Estadística Social de la Universitat de Southampton (Regne Unit) i amb el suport del Departament de Sociologia de la Universitat de Barcelona, convençuts de la seva importància per al nostre col·lectiu.

Atès que la SMSL (Síndrome de la Mort Sobtada del Lactant) és una de les causes més importants de mort entre els nadons en els països desenvolupats, i que a data d'avui és impossible eliminar el risc de patir-la, en els últims 10 anys s'han realitzat notables esforços en la identificació de pautes que el podrien reduir. El coneixement derivat de la investigació dels factors de risc de la SMSL ha portat millores substancials en la prevenció d'aquesta Síndrome i l'objectiu principal del SIDS Project és explorar l'accés a aquest nou coneixement per part dels professionals encarregats d'aconsellar als pares dels nounats.

El SIDS Project és un estudi comparatiu de la difusió dels coneixements sobre la prevenció de la SMSL, que s'està portant a terme a Catalunya, Itàlia i Regne Unit. Per a conèixer l'efectivitat d'aquest procés d'aprenentatge ens ha semblat la millor opció preguntar directament als pediatres mitjançant un breu qüestionari de 18 preguntes que no li costarà més de 5 minuts respondre.

L'enquesta està relacionada amb els factors que influeixen en el risc de patir la SMSL i ha estat revisada per la Societat Catalana de Pediatria. Li agrairíem que contestés a aquestes preguntes de forma lliure i sincera, ja que les seves respostes seran l'eina més important per avaluar l'eficàcia de la formació sobre aquest tema i promoure millores al respecte.

Li agraim la seva ajuda atès que vostè forma part del reduït grup de pediatres seleccionats aleatòriament per a participar en aquest estudi. Les seves respostes són voluntàries i romandran confidencials. Tant aviat com els enviaments acabin, el seu nom serà eliminat dels nostres arxius i les seves respostes no hi seran associades. El SIDS Project ha estat revisat i aprovat tant pel Comitè Ètic com per l'Oficina Governamental d'Investigació de la Universitat de Southampton (Project ID:1197).

En aquesta carta hem inclòs un sobre franquejat que esperem li minimitzi qualsevol molèstia. Si té algun dubte sobre aquest estudi, restem a la seva disposició a l'adreça '*The SIDS Project, Àrea de Praxi, Passeig de la Bonanova 47, 08017, Barcelona*' o bé al correu electrònic sidsproject@comb.cat.

Compartint el seu coneixement sobre la SMSL ens serà de gran ajuda, i estarem encantats de informar-lo dels resultats de l'estudi.

Restem a l'espera de la seva resposta i aprofitem l'avinentsa per enviar-li una cordial salutació.

Dr. Josep Arimany Manso
Director de l'Àrea de Praxi

Sr. Federico de Luca
Coordinador del SIDS Project

Appendix 6: Questionnaire - Spain



Prevenir el SMSL: estudio comparativo de pediatría en España, Italia y Reino Unido

1 ¿Cuántos años lleva ejerciendo la pediatría?

año(s)

2 ¿En que ámbito asistencial trabaja?

Puede seleccionar más de una respuesta

- ☐ CAP (Centro de Asistencia Primaria)
☐ Clínica privada
☐ Consulta privada propia
☐ Hospital público
☐ Hospital privado
☐ Jubilado/a

3 ¿Dónde obtuvo su licenciatura?

- ☐ En España
☐ En otro país (¿Cuál?)

4 ¿Dónde obtuvo su especialidad en Pediatría?

- ☐ En España
☐ En otro país (¿Cuál?)

5 ¿Conoce o ha oído hablar del Síndrome de Muerte Súbita del Lactante (SMSL), también conocido como "muerte súbita inesperada infantil"?

- ☐ Sí
☐ No → Vaya a la pregunta 17

6 ¿Ha tenido alguna experiencia directa con un caso de SMSL?

- ☐ Sí
☐ No

7 En su práctica asistencial, ¿con qué frecuencia informa sobre el SMSL?

- ☐ Más de una vez a la semana
☐ Aproximadamente una vez a la semana
☐ Menos frecuentemente
☐ Nunca

8 ¿Cómo calificaría su seguridad a la hora de tratar asuntos relacionados con el SMSL con los padres del recién nacido?

- ☐ Muy alta
☐ Bastante alta
☐ Media
☐ Bastante baja
☐ Muy baja

9 ¿Cómo calificaría su conocimiento sobre el SMSL y sus factores de riesgo?

- ☐ Muy alto
☐ Bastante alto
☐ Medio
☐ Bastante bajo
☐ Muy bajo

10 ¿Sabría decir cuál/cuáles de las siguientes posiciones está/están relacionadas con el menor riesgo de padecer SMSL?

Puede seleccionar más de una respuesta

- ☐ Decúbito prono
☐ Decúbito supino
☐ Lateral
☐ No lo sé

11 ¿Qué efecto cree que pueden tener las siguientes conductas en el riesgo de que el bebé sufra el SMSL?

Por favor, marque el efecto que corresponda a cada conducta

	Aumenta el riesgo del SMSL (↑)	Reduce el riesgo del SMSL (↓)	No afecta al riesgo del SMSL (=)	No lo sé (?)
Colocar al bebé a dormir en decúbito supino	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Ofrecer al bebé un chupete en la siesta y a la hora de dormir	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Usar un colchón firme en la cuna	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Permitir que el bebé duerma en la misma cama que sus padres	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Fomentar que el bebé esté boca abajo cuando está despierto y vigilado	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Hacer que el bebé toque con los pies el pie de la cuna mientras duerme	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Fumar durante el embarazo	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)

Continúa...

(Continúa...) ¿Qué efecto cree que pueden tener las siguientes conductas en el riesgo de que el bebé sufra el SMSL? <i>Por favor, marque el efecto que corresponda a cada conducta</i>	Aumenta el riesgo del SMSL (↑)	Reduce el riesgo del SMSL (↓)	No afecta al riesgo del SMSL (=)	No lo sé (?)
Permitir que el bebé duerma en la misma habitación que sus padres	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Colocar al bebé a dormir en decúbito prono	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Lactancia materna	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Realizar un electrocardiograma (ECG) al bebé	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Colocar en la cuna objetos blandos como almohadas, edredones, peluches	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Mantener la habitación del bebé a una temperatura inferior a los 20° C	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Fumar (tanto el padre como la madre) en el entorno del bebé	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Dormir con el bebé en un sofá o sillón	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)

12 ¿En su práctica asistencial, con qué frecuencia informa sobre la posición correcta para poner a dormir a los bebés?

- ☐ Más de una vez a la semana
☐ Aproximadamente una vez a la semana
☐ Dos o tres veces al mes
☐ Aproximadamente una vez al mes
☐ Menos de una vez al mes
☐ Nunca → *Vaya a la pregunta 14*

13 ¿Qué posición suele recomendar?

Puede seleccionar más de una respuesta

- ☐ Decúbito prono
☐ Decúbito supino
☐ Lateral
☐ No suelo recomendar ninguna posición

14 ¿Se considera cualificado/a para aconsejar y dar recomendaciones sobre el SMSL y sus factores de riesgo a los padres?

- ☐ Sí
☐ No

15 ¿Podría indicarnos el año en el que recibió su curso de formación más reciente sobre el SMSL?

- ☐ Nunca recibí ningún curso de formación sobre el SMSL → *Vaya a la pregunta 17*

16 ¿Cuál es su valoración de su más reciente curso de formación sobre el SMSL?

- ☐ Satisfecho/a
☐ Ni satisfecho/a ni insatisfecho/a
☐ Insatisfecho/a

17 ¿Tiene usted hijos (de cualquier edad)?

- ☐ Sí
☐ No → *Sáltese la pregunta 18*

18 ¿Tiene algún hijo menor de 3 años?

- ☐ Sí
☐ No

Si desea que le mantengamos informado/a de los resultados de esta investigación, por favor escriba su dirección de correo electrónico

@

Si desea darnos su opinión sobre esta encuesta o si hay algo que le gustaría hacernos saber, puede hacerlo en el siguiente espacio:

**Apreciamos mucho su ayuda.
¡Muchas gracias!**

Si tiene alguna duda, por favor contacte con Federico de Luca en sidsproject@comb.cat, o escriba a:
The SIDS Project, Àrea de Praxi, P. de la Bonanova 47, 08017 Barcelona

Código cuestionario
T77F13

UNIVERSITY OF Southampton

Prevenir la SMSL: estudi comparatiu en pediatria d'Espanya, Itàlia i Regne Unit

1 Quants anys porta exercint la Pediatria?

any(s)

2 A quin àmbit assistencial treballa?

Pot seleccionar més d'una resposta

- ☐ CAP (Centre d'Assistència Primària)
☐ Clínica privada
☐ Consulta privada pròpia
☐ Hospital públic
☐ Hospital privat
☐ Jubilat

3 On va obtenir la seva llicenciatura?

- ☐ A Espanya
☐ A un altre país (Quin?)

4 On va obtenir la seva especialitat en Pediatria?

- ☐ A Espanya
☐ A un altre país (Quin?)

5 Ha sentit parlar de la Síndrome de la Mort Sobtada del Lactant (SMSL), també coneguda com a "mort sobtada inesperada infantil"?

- ☐ Sí
☐ No → *Vagi a la pregunta 17*

6 Ha tingut alguna experiència directa amb un cas de SMSL?

- ☐ Sí
☐ No

7 En la seva pràctica assistencial, amb quina freqüència informa sobre la SMSL?

- ☐ Més d'una vegada a la setmana
☐ Aproximadament una vegada a la setmana
☐ Menys freqüent
☐ Mai

8 Com qualificaria la seva seguretat alhora de tractar assumptes relacionats amb la SMSL amb els pares dels nadons?

- ☐ Molt alta
☐ Bastant alta
☐ Mitjana
☐ Bastant baixa
☐ Molt baixa

9 Com qualificaria el seu coneixement sobre la SMSL i els seus factors de risc?

- ☐ Molt alt
☐ Bastant alt
☐ Mitjà
☐ Bastant baix
☐ Molt baix

10 Sabria dir quina o quines de les següents posicions està o estan relacionades amb el menor risc de patir SMSL?


Pot seleccionar més d'una resposta

- ☐ Decúbit pron
☐ Decúbit supí
☐ Lateral
☐ No ho sé

11 Quin efecte creu que poden tenir les següents conductes en el risc de que el nadó pateixi la SMSL?

Si us plau, marqui l'efecte que correspongui a cada conducta

	Augmenta el risc de la SMSL (↑)	Redueix el risc de la SMSL (↓)	No afecta al risc de la SMSL (=)	No ho sé (?)
Col·locar el nadó a dormir en posició supina	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Oferir al nadó un xumet a l'hora de la migdiada i a l'hora de dormir	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Utilitzar un matalàs dur en el bressol	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Permetre que el nadó dormi en el mateix llit que els seus pares	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Fomentar que el nadó estigui boca terrosa quan estigui despert i vigilant	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Fer que el nadó toqui amb els peus els peus del bressol quan dormi	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Fumar durant l'embaràs	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)

Continua... 

(Continua...)

Quin efecte creu que poden tenir les següents conductes en el risc de que el nadó pateixi la SMSL?

Si us plau, marqui l'efecte que correspongui a cada conducta

	Augmenta el risc de la SMSL (↑)	Redueix el risc de la SMSL (↓)	No afecta al risc de la SMSL (=)	No ho sé (?)
Permetre que el nadó dormi a la mateixa habitació que els seus pares	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Col·locar el nadó a dormir en posició pron	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Lactància materna	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Realitzar un electrocardiograma (ECG) al nadó	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Col·locar en el bressol objectes tous com un coixí, edredons, peluix	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Mantenir l'habitació del nadó a una temperatura inferior als 20° C	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Fumar (tant el pare como la mare) a l'entorn del nadó	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)
Dormir amb el nadó a un sofà o butaca	<input type="checkbox"/> (↑)	<input type="checkbox"/> (↓)	<input type="checkbox"/> (=)	<input type="checkbox"/> (?)

12 En la seva pràctica assistencial, amb quina freqüència informa sobre la posició correcta per posar els nadons a dormir?

- ☐ Més d'una vegada a la setmana
☐ Aproximadament una vegada a la setmana
☐ Dos o tres vegades al mes
☐ Aproximadament una vegada al mes
☐ Menys d'una vegada al mes
☐ Mai → *Vagi a la pregunta 14*

13 Quina posició acostuma a recomanar?

Pot seleccionar més d'una resposta

- ☐ Decúbit pron
☐ Decúbit supí
☐ Lateral
☐ No acostumo a recomanar cap posició

14 Es considera qualificat/da per aconsellar i donar recomanacions sobre la SMSL i els seus factors de risc als pares?

- ☐ Si
☐ No

15 Podria indicar-nos l'any en el que va rebre el seu curs de formació més recent sobre la SMSL?

- ☐ Mai he rebut cap curs de formació sobre el SMSL → *Vagi a la pregunta 17*

16 Quina és la valoració del seu curs de formació més recent sobre la SMSL?

- ☐ Satisfet/a
☐ Ni satisfet/a ni insatisfet/a
☐ Insatisfet/a

17 Té fills (de qualsevol edat)?

- ☐ Si
☐ No → *Saltis la pregunta 18*

18 Té algun fill menor de 3 anys?

- ☐ Si
☐ No

Si desitja que el mantinguem informat/da dels resultats de la investigació, si us plau escrigui la seva adreça de correu electrònic

@

Si ens vol donar la seva opinió sobre aquesta enquesta o si hi ha alguna cosa que li agradaria fer-nos saber, pot fer-ho en el següent espai:

**Agraïm molt la seva ajuda,
Moltes gràcies!**

Per a qualsevol dubte contacti amb Federico de Luca a sidsproject@comb.cat, o escrigui a:
The SIDS Project, Àrea de Praxi, Passeig de la Bonanova 47, 08017 Barcelona

Codi qüestionari
T77F13

Appendix 7: Postcard reminder - Spain

19 de novembre 2012

Benvolgut Dr. [surname],

El 5 de novembre passat varem enviar-li un qüestionari demanant la seva ajuda per a The SIDS Project, un estudi del coneixement sobre la prevenció de la Síndrome de la Mort Sobtada del Lactant (SMSL) dels pediatres.

Si ja ha complimentat i reenviat el qüestionari, li agrairé sincerament la seva ajuda.

Si encara no ha pogut complimentar-lo, li agrairíem enormament que ens ho fes arribar el més aviat possible. Per a aconseguir resultats precisos, és essencial rebre resposta de tots els participants.

Si no ha rebut el seu qüestionari, o l'ha perdut, si us plau, contacti amb nosaltres a sidsproject@comb.cat o a l'adreça de correu que apareix a l'anvers d'aquesta postal, i n'hi enviarem un altre tan aviat com rebem el seu missatge.

Atentament,



Federico de Luca

Coordinador del SIDS Project



UNIVERSITY OF
Southampton

The SIDS Project
Àrea de Praxis
Passeig de la Bonanova 47
08017, Barcelona

Dr. [name] [surname]
[street and number]
[postcode], [city]



CONSELL DE COL·LEGIS DE METGES
DE CATALUNYA

Appendix 8: Follow-up letter - Spain



Barcelona, 3 de Diciembre 2012

Estimado Doctor [surname],

Este es el último envío postal de la encuesta que le permitirá involucrarse en el SIDS Project. Tal como le mencionamos en nuestra carta anterior, el SIDS Project tiene como propósito realizar las primeras comparaciones en Europa sobre cómo el conocimiento relacionado con los factores de riesgo de padecer el Síndrome de Muerte Súbita del Lactante es transmitido a aquellos encargados de dar consejo a los padres de los neonatos. Una encuesta similar ha sido ya realizada en Italia y Reino Unido, sin embargo, mientras la tasa de respuesta obtenida en la encuesta italiana rondó el 60% y en la inglesa el 45%, por ahora la equivalente catalana lucha por llegar a un 25%.

Según nuestros datos, el cuestionario que le fue incluido en nuestra primera carta todavía no ha sido devuelto, y le escribo de nuevo debido a la gran importancia que su respuesta supone a la hora de obtener unos resultados precisos. Sólo obteniendo la respuesta de cada uno de los profesionales que hemos seleccionado, podemos estar seguros de que los resultados representan fielmente a los pediatras de su área. Por ello, le estaríamos muy agradecidos si pudiera completar el cuestionario lo antes posible. Por favor, tenga en cuenta que la fecha límite para enviárnoslo es el **21 de Diciembre de 2012**.

En el caso de que haya extraviado la copia original del cuestionario, hemos incluido en esta carta otra copia y un nuevo sobre pre-dirigido y pre-franqueado para su envío. El cuestionario contiene sólo 18 preguntas y le llevará menos de 5 minutos completarlo. Le agradeceríamos que contestara a estas preguntas de forma libre y sincera, ya que sus respuestas serán la herramienta más importante para evaluar la eficacia de la formación sobre este tema y promover mejoras al respecto. Si prefiriere recibir el cuestionario en catalán volveremos a enviárselo tan pronto como nos lo haga saber.

Sus respuestas son voluntarias y permanecerán confidenciales. Tan pronto como los envíos acaben, eliminaremos su nombre de nuestros archivos y sus respuestas nunca serán asociadas con él. El SIDS Project ha sido revisado y aprobado por el Comité Ético y la Oficina Gubernamental de Investigación de la Universidad de Southampton (Project ID: 1197). Si tiene alguna duda sobre este estudio, quedamos a su disposición en la dirección 'The SIDS Project, Área de Praxis, P. de la Bonanova 47, 08017 Barcelona' o bien al correo electrónico sidsproject@comb.cat.

Tomándose unos minutos para compartir su conocimiento sobre el SMSL, nos ayuda enormemente y, si lo desea, estaremos encantados de informarle de los resultados del estudio.

Quedamos a la espera de su respuesta y aprovechamos la ocasión para enviarle un cordial saludo.

Dr. Josep Arimany Manso
Director de l'Àrea de Praxi

Sr. Federico de Luca
Coordinador del SIDS Project



Barcelona, 3 de desembre 2012

Benvolgut Dr. [surname],

Aquest és el darrer enviament postal de l'enquesta que li permetrà col·laborar amb el SIDS Project. Tal com li varem indicar en la carta anterior, el SIDS Project té com a objectiu fer les primeres comparacions a Europa en referència a com el coneixement relacionat amb els factors de risc de patir la Síndrome de la Mort Sobtada del Lactant (SMSL) és transmès als encarregats d'aconsellar els pares dels neonats. Una enquesta similar ja ha estat realitzada a Itàlia i al Regne Unit, no obstant això, pel que fa a la taxa de resposta obtinguda, l'enquesta italiana rondà el 60% i l'anglesa el 45%, mentre que l'equivalent catalana lluita per arribar al 25%.

Segons les nostres dades, el qüestionari que li varem remetre en el primer enviament encara no ha estat retornat, i li escrivim de nou per la gran importància que la seva resposta suposa a l'hora d'obtenir uns resultats precisos. Només amb la resposta de tots els professionals que hem seleccionat, podem estar segurs que els resultats representen fidelment els pediatres de la seva àrea. Per això, li estariem molt agraïts si pogués complimentar el qüestionari el més aviat possible. Si us plau, tingui en compte que la data límit per enviar-nos-el és el **21 de desembre de 2012**.

En el cas que hagi extraviat la còpia original del qüestionari, hem inclòs en aquesta carta una altra còpia i un nou sobre pre-dirigit i franquejat per al seu enviament. El qüestionari conté només 18 preguntes i no li costarà més de 5 minuts complimentar-lo. Li agrairiem que contestés aquestes preguntes de forma lliure i sincera, ja que seran l'eina més important per avaluar l'eficàcia de la formació sobre aquest tema i promoure millores al respecte. Si preferís rebre el qüestionari en català només ens ho ha de fer saber i li tornarem a enviar.

Les seves respostes són voluntàries i romandran confidencials. Tant aviat com els enviaments acabin, el seu nom serà eliminat dels nostres arxius i les seves respostes no hi seran associades. El SIDS Project ha estat aprovat pel Comitè Ètic i per l'Oficina Governamental d'Investigació de la Universitat de Southampton (Project ID:1197). Si té algun dubte sobre aquest estudi, restem a la seva disposició a l'adreça '*The SIDS Project, Àrea de Praxi, P. de la Bonanova 47, 08017 Barcelona*' o bé al correu electrònic sidsproject@comb.cat.

Si dedica uns minuts a compartir el seu coneixement sobre la SMSL, ens estarà ajudant en gran mesura, i si ho desitja, estarem encantats d'informar-lo dels resultats d'aquest estudi.

Restem a l'espera de la seva resposta i aprofitem l'avinentsa per enviar-li una cordial salutació.

Dr. Josep Arimany Manso
Director de l'Àrea de Praxi

Sr. Federico de Luca
Coordinador del SIDS Project

Appendix 9: Email reminder - Spain

Benvolgut Dr. XXX,

Aquest és l'últim contacte que li permetrà involucrar-se en el SIDS Project. Tal com varem informar-lo a les nostres cartes anteriors, el SIDS Project és un projecte sobre la Síndrome de la Mort Sobtada del Lactant (SMSL) i els seus factors de risc. El seu objectiu és fer les primeres comparacions a Europa sobre com el coneixement sobre aquest tema és transmès als encarregats d'aconsellar als pares dels nounats.

Després dels 3 enviaments postals l'enquesta catalana ronda una taxa de resposta del 37%, encara lluny de les taxes registrades a Itàlia (60%) i en el Regne Unit (45%). Per aquesta raó hem decidit enviar-li aquest darrer recordatori, pensant que potser li sigui més convenient omplir l'enquesta online.

Si fos tan amable de participar, només hauria d'obrir l'enllaç al final d'aquest paràgraf. Aquesta operació no li portarà més de 5 minuts, però ajudarà molt a que els resultats representin fidelment els pediatres de la seva àrea.

[Respondre al questionari](#)

Les seves respostes són voluntàries i restaran confidencials. Tan aviat com els enviaments acabin, eliminarem el seu nom dels nostres arxius i les seves respostes ja no hi quedaran associades. El SIDS Project ha estat revisat i aprovat pel Comitè Ètic i l'Oficina Governamental d'Investigació de la Universitat de Southampton (Project ID: 1197).

Si té algun dubte sobre aquest estudi, quedem a la seva disposició a l'adreça 'The SIDS Project, Àrea de Praxis, P. de la Bonanova 47, 08017 Barcelona' o bé al correu electrònic sidsproject@comb.cat.

Dedicant uns minuts a compartir el seu coneixement sobre la SMSL, ens ajuda en gran mesura i, si ho desitja, estarem encantats d'informar-lo dels resultats de l'estudi.

Cordialment,

The SIDS Project

Estimado Dr. XXX,

Éste es el último contacto que le permitirá involucrarse en el SIDS Project. Tal como le mencionamos en nuestras cartas anteriores, el SIDS Project es un proyecto sobre el Síndrome de Muerte Súbita del Lactante (SMSL) y sus factores de riesgo. Su objetivo es realizar las primeras comparaciones en Europa sobre cómo el conocimiento sobre este tema es transmitido a los encargados de aconsejar a los padres de los neonatos.

Después de nuestros 3 envíos postales la encuesta catalana ronda una tasa de respuesta del 37%, todavía lejos de las tasas registradas en Italia (60%) y en el Reino Unido (45%). Por esta razón hemos decidido enviarle este último recordatorio, pensando que quizás le sea más conveniente rellenar la encuesta online.

Si fuera tan amable de participar, solo tendría que abrir el enlace al final de este párrafo. Toda la operación no le llevará más de 5 minutos, pero ayudará mucho a que los resultados representen fielmente a los pediatras de su área.

[Responder al cuestionario](#)

Sus respuestas son voluntarias y permanecerán confidenciales. Tan pronto como los envíos acaben, eliminaremos su nombre de nuestros archivos y sus respuestas ya no le quedarán asociadas. El SIDS Project ha sido revisado y aprobado por el Comité Ético y la Oficina Gubernamental de Investigación de la Universidad de Southampton (Project ID: 1197).

Si tiene alguna duda sobre este estudio, quedamos a su disposición en la dirección 'The SIDS Project, Área de Praxis, P. de la Bonanova 47, 08017 Barcelona' o bien al correo electrónico sidsproject@comb.cat.

Dedicando unos minutos a compartir su conocimiento sobre el SMSL, nos ayuda enormemente y, si lo desea, estaremos encantados de informarle de los resultados del estudio.

Cordialmente,

The SIDS Project

Appendix 10: Email questionnaire - Spain

UNIVERSITY OF
Southampton

**Prevenir la SMSL: estudi comparatiu en pediatria
d'Espanya, Itàlia i Regne Unit**

Español ▼

¿Cuántos años lleva ejerciendo la pediatría?

Año(s)

¿En que ámbito asistencial trabaja?
Puede seleccionar más de una respuesta

☐ CAP (Centro de Asistencia Primaria)

☐ Clínica privada

☐ Consulta privada propia

☐ Hospital público

☐ Hospital privado

☐ Jubilado/a

¿Dónde obtuvo su licenciatura?

☐ En España

☐ En otro país ¿Cuál?

¿Dónde obtuvo su especialidad en Pediatría?

☐ En España

☐ En otro país ¿Cuál?

**¿Conoce o ha oído hablar del Síndrome de Muerte Súbita del Lactante (SMSL),
también conocido como "muerte súbita inesperada infantil"?**

☐ Si

☐ No

>>

UNIVERSITY OF Southampton

Prevenir la SMSL: estudi comparatiu en pediatria d'Espanya, Itàlia i Regne Unit

Español ▼

¿Ha tenido alguna experiencia directa con un caso de SMSL?

- ☐ Sí
- ☐ No

En su práctica asistencial, ¿con qué frecuencia informa sobre el SMSL?

- ☐ Más de una vez a la semana
- ☐ Aproximadamente una vez a la semana
- ☐ Menos frecuentemente
- ☐ Nunca

¿Cómo calificaría su seguridad a la hora de tratar asuntos relacionados con el SMSL con los padres del recién nacido?

- ☐ Muy alta
- ☐ Bastante alta
- ☐ Media
- ☐ Bastante baja
- ☐ Muy baja

¿Cómo calificaría su conocimiento sobre el SMSL y sus factores de riesgo?

- ☐ Muy alto
- ☐ Bastante alto
- ☐ Medio
- ☐ Bastante bajo
- ☐ Muy bajo

¿Sabría decir cuál o cuáles de las siguientes posiciones está o están relacionadas con el menor riesgo de padecer SMSL?

Puede seleccionar más de una respuesta

- ☐ Decúbito prono
- ☐ Decúbito supino
- ☐ Lateral
- ☐ No lo sé

<< >>

UNIVERSITY OF Southampton

Prevenir la SMSL: estudi comparatiu en pediatria d'Espanya, Itàlia i Regne Unit

Español ▼

¿Qué efecto cree que pueden tener las siguientes conductas en el riesgo de que el bebé sufra el SMSL?

Por favor, marque el efecto que corresponda a cada conducta

	Aumenta el riesgo del SMSL (↑)	Reduce el riesgo del SMSL (↓)	No afecta al riesgo del SMSL (=)	No lo sé (?)
Colocar al bebé a dormir en decúbito supino	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ofrecer al bebé un chupete en la siesta y a la hora de dormir	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Usar un colchón firme en la cuna	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Permitir que el bebé duerma en la misma cama que sus padres	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fomentar que el bebé esté boca abajo cuando está despierto y vigilado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hacer que el bebé toque con los pies el pie de la cuna mientras duerme	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fumar durante el embarazo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<< >>

UNIVERSITY OF
Southampton

**Prevenir la SMSL: estudi comparatiu en pediatria
d'Espanya, Itàlia i Regne Unit**

Español ▼

(Continúa...)
**¿Qué efecto cree que pueden tener las siguientes conductas en el riesgo de que el
bebé sufra el SMSL?**
Por favor, marque el efecto que corresponda a cada conducta

	Aumenta el riesgo del SMSL (↑)	Reduce el riesgo del SMSL (↓)	No afecta al riesgo del SMSL (=)	No lo sé (?)
Permitir que el bebé duerma en la misma habitación que sus padres	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Colocar al bebé a dormir en decúbito prono	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lactancia materna	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Realizar un electrocardiograma (ECG) al bebé	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Colocar en la cuna objetos blandos como almohadas, edredones, peluches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mantener la habitación del bebé a una temperatura inferior a los 20° C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fumar (tanto el padre como la madre) en el entorno del bebé	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dormir con el bebé en un sofá o sillón	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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UNIVERSITY OF
Southampton

**Prevenir la SMSL: estudi comparatiu en pediatria
d'Espanya, Itàlia i Regne Unit**

Español ▾

¿En su práctica asistencial, con qué frecuencia informa sobre la posición correcta para poner a dormir a los bebés?

☐ Más de una vez a la semana

☐ Aproximadamente una vez a la semana

☐ Dos o tres veces al mes

☐ Aproximadamente una vez al mes

☐ Menos de una vez al mes

☐ Nunca

¿Se considera cualificado/a para aconsejar y dar recomendaciones sobre el SMSL y sus factores de riesgo a los padres?

☐ Sí

☐ No

¿Podría indicarnos el año en el que recibió su curso de formación más reciente sobre el SMSL?

☐ Año

☐ Nunca recibí ningún curso de formación sobre el SMSL

<<

>>

UNIVERSITY OF Southampton

Prevenir la SMSL: estudi comparatiu en pediatria d'Espanya, Itàlia i Regne Unit

Español ▼

¿Tiene usted hijos (de cualquier edad)?

- ☐ Sí
☐ No

Si desea que le mantengamos informado/a de los resultados de esta investigación,
por favor escriba su dirección de correo electrónico

Si desea darnos su opinión sobre esta encuesta o si hay algo que le gustaría
hacernos saber, puede hacerlo en el siguiente espacio:

Apreciamos mucho su ayuda. ¡Muchas gracias!

<<

>>

UNIVERSITY OF
Southampton

**Prevenir la SMSL: estudi comparatiu en pediatria
d'Espanya, Itàlia i Regne Unit**

Español ▾

Si tiene alguna duda, por favor contacte con Federico de Luca en
sidsproject@soton.ac.uk
o escriba a:
The SIDS Project, Àrea de Praxi, P. de la Bonanova 47, 08017, Barcelona

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Appendix 11: Questionnaire - Italy (pages of interest)

Regione: _____
Data: _____




*Ministero del Lavoro, della Salute
e delle Politiche Sociali*

Gentile Operatore,
 Le chiediamo alcuni minuti del Suo tempo per la compilazione del presente questionario. La Sua collaborazione sarà di grande utilità per la Campagna "GenitoriPiù", campagna informativa sulla promozione della salute nei primi anni di vita del bambino, promossa dal Ministero della Salute. Questa scheda ha l'obiettivo di rilevare gli atteggiamenti assunti dagli **Operatori del Percorso Nascita** sulle tematiche della Campagna "GenitoriPiù".

In collaborazione con:


REGIONE DEL VENETO


fimp


unicef


**UNIVERSITÀ
CA' FOSCARI
VENEZIA**


**Ufficio Promozione della Salute
Dipartimento di Prevenzione
ULSS 20 - Verona**

Risponda per piacere a tutte le domande mettendo una crocetta sulla risposta che ritiene corretta



Dati anagrafici e professionali

1. **Sesso:** ☐ FEMMINA ☐ MASCHIO
2. **Età:** ☐ MENO DI 24 ANNI
 ☐ DA 25 A 34 ANNI
 ☐ DA 35 A 44 ANNI
 ☐ DA 45 A 54 ANNI
 ☐ DA 55 A 64 ANNI
 ☐ PIÙ DI 65 ANNI
3. **Da quale anno esercita il ruolo che ricopre attualmente?** ANNO: _____
4. **Azienda Sanitaria nella quale lavora:**

5. **Ruolo:** ☐ ASSISTENTE SANITARIO
 ☐ OSTETRICA
 ☐ PSICOLOGO/A
 ☐ PEDIATRA
 ☐ GINECOLOGO/A
 ☐ RUOLO ORGANIZZATIVO/
 COORDINAMENTO
 ☐ ALRO (SPECIFICARE) _____
6. **Dove lavora?** ☐ CONSULTORIO
 ☐ PUNTO NASCITA
 ☐ AMBULATORIO MEDICO
 ☐ SERVIZI VACCINALI
 ☐ DIPARTIMENTO/SERVIZIO
 DI SALUTE/SANITÀ PUBBLICA
 ☐ DISTRETTO
 ☐ ALRO _____

3. Durante la Sua attività, dà ai genitori consigli sull'allattamento al seno?

☐ SEMPRE

☐ SPESSO

☐ RARAMENTE

☐ MAI

3.a Se dà questo tipo di informazioni sempre o spesso, lo fa prevalentemente (una sola risposta):

☐ SU SUA INIZIATIVA

☐ SOLO SE LE VIENE RICHIESTO

☐ IN PRESENZA DI UN PROBLEMA DI SALUTE

3.b Se raramente o mai, perché non dà questo tipo di informazioni? (anche più risposte)

☐ L'ORGANIZZAZIONE DEL LAVORO NON GLIELO CONSENTE

☐ QUESTE INFORMAZIONI NON SONO DI SUA COMPETENZA

☐ NON HA COMPETENZA SUFFICIENTE PER DARE QUESTE INFORMAZIONI

☐ NON C'È SUFFICIENTE ACCORDO SCIENTIFICO/ EVIDENZA SU QUESTE TEMATICHE

☐ ALTRO (SPECIFICARE) _____

Se non dà "mai" consigli sull'allattamento materno passi alla domanda 6.

4. Per quanto tempo, in genere, consiglia ad una madre di allattare esclusivamente al seno il proprio figlio? N. MESI: _____

☐ NON CONSIGLIO UN TEMPO DEFINITO

5. In genere, Lei consiglia di continuare l'allattamento al seno anche dopo l'introduzione di alimenti solidi o liquidi? ☐ sì ☐ NO

6. *Per tutti*, quanto ritiene importante, per il Suo ruolo professionale, informare le donne su alcune pratiche per la gestione dell'allattamento al seno (quali la posizione, l'attacco, l'alimentazione a richiesta)?

PER NIENTE
IMPORTANTE

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

6 ☐

7 ☐

MOLTO
IMPORTANTE

7. Secondo Lei, i genitori della Sua ASL hanno le informazioni necessarie per decidere in maniera consapevole riguardo all'alimentazione del lattante?

SÌ, TUTTI ☐

SOLO ALCUNI ☐

NON SÌ ☐

LA MAGGIORANZA ☐

NESSUNO ☐

CIRCA LA METÀ ☐

Sezione C – Posizione del lattante in culla

1. Fra i fattori e i comportamenti elencati qui di seguito ve ne sono alcuni noti per proteggere il bambino dalla SIDS. Identifichi per ogni fattore elencato se è in grado di proteggere il bambino dalla SIDS

1.a Mettere a dormire il bambino a pancia in su

☐ PROTEGGE

☐ NON PROTEGGE

☐ NON SÌ

1.b Evitare di fumare nella stanza in cui il bambino dorme

☐ PROTEGGE

☐ NON PROTEGGE

☐ NON SÌ

1.c Utilizzare un materasso morbido per il lettino del bambino

☐ PROTEGGE

☐ NON PROTEGGE

☐ NON SÌ

1.d Allattare al seno

☐ PROTEGGE

☐ NON PROTEGGE

☐ NON SÌ

1.e Tenere alta la temperatura nella stanza in cui il bambino dorme

☐ PROTEGGE

☐ NON PROTEGGE

☐ NON SÌ

1.f Fare in modo che il bambino tocchi con i piedi il fondo della culla

☐ PROTEGGE

☐ NON PROTEGGE

☐ NON SÌ



2. Ritiene che lo screening elettrocardiografico eseguito a tutti i neonati sia un intervento efficace per prevenire la SIDS?

☐ SÌ ☐ NO ☐ NON SO

3. Durante la Sua attività, dà ai genitori informazioni sulla corretta posizione da far assumere al bambino in culla?

☐ SEMPRE

☐ SPESSO

☐ RARAMENTE

☐ MAI

3.a Se dà questo tipo di informazioni sempre o spesso, lo fa prevalentemente (una sola risposta):

☐ SU SUA INIZIATIVA
☐ SOLO SE LE VIENE RICHIESTO

3.b Se raramente o mai, perché non dà questo tipo di informazioni? (anche più risposte)

☐ L'ORGANIZZAZIONE DEL LAVORO NON GLIELO CONSENTE
☐ QUESTE INFORMAZIONI NON SONO DI SUA COMPETENZA
☐ NON HA COMPETENZA SUFFICIENTE PER DARE QUESTE INFORMAZIONI
☐ NON C'È SUFFICIENTE ACCORDO SCIENTIFICO/ EVIDENZA SU QUESTE TEMATICHE
☐ ALTRO (SPECIFICARE) _____

Se non dà "mai" informazioni sulla corretta posizione del lattante in culla passi alla domanda 5.

4. Qual è la posizione che raccomanda?

☐ A PANCIA IN SU ☐ A PANCIA IN GIÙ
☐ SUL FIANCO ☐ A PANCIA IN SU O SUL FIANCO
☐ NON RACCOMANDO UNA POSIZIONE SPECIFICA

5. Per tutti, quanto ritiene importante, per il Suo ruolo professionale, informare i genitori sulla corretta posizione da far assumere al bambino in culla?

PER NIENTE IMPORTANTE 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ MOLTO IMPORTANTE

6. Secondo Lei, i genitori della Sua ASL hanno le informazioni necessarie per un corretto posizionamento del bambino in culla?

SI, TUTTI ☐ SOLO ALCUNI ☐ NON SO ☐
LA MAGGIORANZA ☐ NESSUNO ☐
CIRCA LA METÀ ☐

Sezione D – Utilizzo di mezzi di protezione in auto (seggiolini)

1. Durante la Sua attività, dà ai genitori informazioni sulle pratiche per il corretto posizionamento del bambino durante i tragitti in automobile?

☐ SEMPRE

☐ SPESSO

☐ RARAMENTE

☐ MAI

1.a Se dà questo tipo di informazioni sempre o spesso, lo fa prevalentemente (una sola risposta):

☐ SU SUA INIZIATIVA
☐ SOLO SE LE VIENE RICHIESTO

1.b Se raramente o mai, perché non dà questo tipo di informazioni? (anche più risposte)

☐ L'ORGANIZZAZIONE DEL LAVORO NON GLIELO CONSENTE
☐ QUESTE INFORMAZIONI NON SONO DI SUA COMPETENZA
☐ NON HA COMPETENZA SUFFICIENTE PER DARE QUESTE INFORMAZIONI
☐ NON C'È SUFFICIENTE ACCORDO SCIENTIFICO/ EVIDENZA SU QUESTE TEMATICHE
☐ ALTRO (SPECIFICARE) _____

Se non dà "mai" informazioni sul corretto posizionamento del bambino in automobile passi alla domanda 3.

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