STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

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|  | Item No | Recommendation | Page number  | Relevant text from manuscript  |
| **Title and abstract** | 1 | (*a*) Indicate the study’s design with a commonly used term in the title or the abstract | 1 | Title and abstract |
| (*b*) Provide in the abstract an informative and balanced summary of what was done and what was found | 3 | Abstract  |
| Introduction |  |  |
| Background/rationale | 2 | Explain the scientific background and rationale for the investigation being reported | 5 | Introduction  |
| Objectives | 3 | State specific objectives, including any prespecified hypotheses | 11,12 | Research questions and objectives  |
| Methods |  |  |
| Study design | 4 | Present key elements of study design early in the paper | 6 | Section 2 of methods ‘Study design’.  |
| Setting | 5 | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection | 6 | Section 1 of methods ‘Study setting’. Recruitment is outlined in Section 4 of methods ‘participants/patient recruitment’. |
| Participants | 6 | (*a*) Give the eligibility criteria, and the sources and methods of selection of participants | 6, 7 | Section 4 of methods ‘participants/patient recruitment’.  |
| Variables | 7 | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable | 12 | Primary and secondary outcomes defined on page 12. |
| Data sources/ measurement | 8\* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group | *8, 9, 10, 11, 12* | Detail related to the variable *Immune state of the middle ear tissue* is outlined in the section titled ‘Immune cell identification and characterisation’.Detail related to the variable: *Bacterial species in nasal and middle ear swabs* is outlined in section titled ‘Identification of bacterial species’. Detail related to the variable*: viral species of nasal and middle ear swabs* is outlined in section titled ‘Identification of viruses’. Detail related to the variable: *Systemic inflammatory status* outlined in section titled ‘Identification of inflammatory markers in the blood’. Detail related to the variable: *Inflammatory state of the cochlea* is outlined in the section titled ‘Identification of inflammatory markers in the cochlea’.Detail related to the Routine *clinical outcome measures* is outlined in section titled ‘Clinical data collection’.  |
| Bias | 9 | Describe any efforts to address potential sources of bias |  | Not applicable.  |
| Study size | 10 | Explain how the study size was arrived at | 7  | Section 4 of methods ‘participants/patient recruitment’. |
| Quantitative variables | 11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why | 8 - 11 | Section ‘Sample analysis’.  |
| Statistical methods | 12 | (*a*) Describe all statistical methods, including those used to control for confounding | 8, 9, 12 | Sub-section of section titled ‘Sample analysis’ in Spatial transcriptomic analysis section and the clinical data collection section.  |
| (*b*) Describe any methods used to examine subgroups and interactions |  | Not applicable.  |
| (*c*) Explain how missing data were addressed |  | Not applicable.  |
| (*d*) If applicable, describe analytical methods taking account of sampling strategy |  | Not applicable.  |
| (*e*) Describe any sensitivity analyses |  | Not applicable.  |
| Results |  | Not applicable as protocol paper.  |
| Participants | 13\* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed |  | Not applicable as protocol paper. |
| (b) Give reasons for non-participation at each stage |  | Not applicable as protocol paper. |
| (c) Consider use of a flow diagram |  | Overview of participant pathway (Figure 1).  |
| Descriptive data | 14\* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders |  | Not applicable as protocol paper. |
| (b) Indicate number of participants with missing data for each variable of interest |  | Not applicable as protocol paper. |
| Outcome data | 15\* | Report numbers of outcome events or summary measures |  | Not applicable as protocol paper. |
| Main results | 16 | (*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included |  | Not applicable as protocol paper. |
| (*b*) Report category boundaries when continuous variables were categorized |  | Not applicable as protocol paper. |
| (*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period |  | Not applicable as protocol paper. |
| Other analyses | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses |  | Not applicable as protocol paper. |
| Discussion |  |  |
| Key results | 18 | Summarise key results with reference to study objectives |  | Not applicable as protocol paper. |
| Limitations | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias |  | Section ‘Limitations of the study design’, page 12.  |
| Interpretation | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence |  | Not applicable as protocol paper. |
| Generalisability | 21 | Discuss the generalisability (external validity) of the study results |  | Not applicable as protocol paper. |
| Other information |  |  |
| Funding | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based | 6 | Section 3 of methods ‘Study funding’.  |

\*Give information separately for exposed and unexposed groups.

**Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.