

## Supplementary file 1: Checklist for Reporting Of Survey Studies (CROSS) (Sharma A et al., 2021)

| Section/topic             | Item | Item description                                                                                                                                                                                                                                                                                                                                                  | Reported on page # |
|---------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>Title and abstract</b> |      |                                                                                                                                                                                                                                                                                                                                                                   |                    |
| Title and abstract        | 1a   | State the word “survey” along with a commonly used term in title or abstract to introduce the study’s design.                                                                                                                                                                                                                                                     | 1                  |
|                           | 1b   | Provide an informative summary in the abstract, covering background, objectives, methods, findings/results, interpretation/discussion, and conclusions.                                                                                                                                                                                                           | 2                  |
| <b>Introduction</b>       |      |                                                                                                                                                                                                                                                                                                                                                                   |                    |
| Background                | 2    | Provide a background about the rationale of study, what has been previously done, and why this survey is needed.                                                                                                                                                                                                                                                  | 3                  |
| Purpose/aim               | 3    | Identify specific purposes, aims, goals, or objectives of the study.                                                                                                                                                                                                                                                                                              | 4                  |
| <b>Methods</b>            |      |                                                                                                                                                                                                                                                                                                                                                                   |                    |
| Study design              | 4    | Specify the study design in the methods section with a commonly used term (e.g., cross-sectional or longitudinal).                                                                                                                                                                                                                                                | 4                  |
| Data collection methods   | 5a   | Describe the questionnaire (e.g., number of sections, number of questions, number and names of instruments used).                                                                                                                                                                                                                                                 | 5                  |
|                           | 5b   | Describe all questionnaire instruments that were used in the survey to measure particular concepts. Report target population, reported validity and reliability information, scoring/classification procedure, and reference links (if any).                                                                                                                      | 5,6                |
|                           | 5c   | Provide information on pretesting of the questionnaire, if performed (in the article or in an online supplement). Report the method of pretesting, number of times questionnaire was pre-tested, number and demographics of participants used for pretesting, and the level of similarity of demographics between pre-testing participants and sample population. | 5                  |
|                           | 5d   | Questionnaire, if possible, should be fully provided (in the article, or as appendices or as an                                                                                                                                                                                                                                                                   | Suppl file 2       |

|                        |    |                                                                                                                                                                                                                                                               |              |
|------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
|                        |    | online supplement).                                                                                                                                                                                                                                           |              |
| Sample characteristics | 6a | Describe the study population (i.e., background, locations, eligibility criteria for participant inclusion in survey, exclusion criteria).                                                                                                                    | 4            |
|                        | 6b | Describe the sampling techniques used (e.g., single stage or multistage sampling, simple random sampling, stratified sampling, cluster sampling, convenience sampling). Specify the locations of sample participants whenever clustered sampling was applied. | 4            |
|                        | 6c | Provide information on sample size, along with details of sample size calculation.                                                                                                                                                                            | 5            |
|                        | 6d | Describe how representative the sample is of the study population (or target population if possible), particularly for population-based surveys.                                                                                                              | 4            |
| Survey administration  | 7a | Provide information on modes of questionnaire administration, including the type and number of contacts, the location where the survey was conducted (e.g., outpatient room or by use of online tools, such as SurveyMonkey).                                 | 6,7          |
|                        | 7b | Provide information of survey's time frame, such as periods of recruitment, exposure, and follow-up days.                                                                                                                                                     | 4, 7         |
|                        |    | Provide information on the entry process:                                                                                                                                                                                                                     |              |
|                        | 7c | For non-web-based surveys, provide approaches to minimize human error in data entry.<br><br>For web-based surveys, provide approaches to prevent "multiple participation" of participants.                                                                    | N/A<br><br>7 |
| Study preparation      | 8  | Describe any preparation process before conducting the survey (e.g., interviewers' training process, advertising the survey).                                                                                                                                 | N/A          |
| Ethical considerations | 9a | Provide information on ethical approval for the survey if obtained, including informed consent, institutional review board [IRB] approval, Helsinki declaration, and good clinical practice [GCP] declaration (as appropriate).                               | 15           |
|                        | 9b | Provide information about survey anonymity and confidentiality and describe what                                                                                                                                                                              | 7            |

|                               |     |                                                                                                                                                                                                                                                                                       |     |
|-------------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
|                               |     | mechanisms were used to protect unauthorized access.                                                                                                                                                                                                                                  |     |
| Statistical<br>analysis       | 10a | Describe statistical methods and analytical approach. Report the statistical software that was used for data analysis.                                                                                                                                                                | 7   |
|                               | 10b | Report any modification of variables used in the analysis, along with reference (if available).                                                                                                                                                                                       | N/A |
|                               | 10c | Report details about how missing data was handled. Include rate of missing items, missing data mechanism (i.e., missing completely at random [MCAR], missing at random [MAR] or missing not at random [MNAR]) and methods used to deal with missing data (e.g., multiple imputation). | 7   |
|                               | 10d | State how non-response error was addressed.                                                                                                                                                                                                                                           | 7   |
|                               | 10e | For longitudinal surveys, state how loss to follow-up was addressed.                                                                                                                                                                                                                  | N/A |
|                               | 10f | Indicate whether any methods such as weighting of items or propensity scores have been used to adjust for non-representativeness of the sample.                                                                                                                                       | 7   |
|                               | 10g | Describe any sensitivity analysis conducted.                                                                                                                                                                                                                                          | 7   |
| <b>Results</b>                |     |                                                                                                                                                                                                                                                                                       |     |
| Respondent<br>characteristics | 11a | Report numbers of individuals at each stage of the study. Consider using a flow diagram, if possible.                                                                                                                                                                                 | N/A |
|                               | 11b | Provide reasons for non-participation at each stage, if possible.                                                                                                                                                                                                                     | N/A |
|                               | 11c | Report response rate, present the definition of response rate or the formula used to calculate response rate.                                                                                                                                                                         | 7,8 |
|                               | 11d | Provide information to define how unique visitors are determined. Report number of unique visitors along with relevant proportions (e.g., view proportion, participation proportion, completion proportion).                                                                          | 7   |

|                        |     |                                                                                                                                                                                                                                 |     |
|------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Descriptive results    | 12  | Provide characteristics of study participants, as well as information on potential confounders and assessed outcomes.                                                                                                           | 8   |
|                        | 13a | Give unadjusted estimates and, if applicable, confounder-adjusted estimates along with 95% confidence intervals and p-values.                                                                                                   | 10  |
| Main findings          | 13b | For multivariable analysis, provide information on the model building process, model fit statistics, and model assumptions (as appropriate).                                                                                    | N/A |
|                        | 13c | Provide details about any sensitivity analysis performed. If there are considerable amount of missing data, report sensitivity analyses comparing the results of complete cases with that of the imputed dataset (if possible). | 10  |
| <b>Discussion</b>      |     |                                                                                                                                                                                                                                 |     |
| Limitations            | 14  | Discuss the limitations of the study, considering sources of potential biases and imprecisions, such as non-representativeness of sample, study design, important uncontrolled confounders.                                     | 14  |
| Interpretations        | 15  | Give a cautious overall interpretation of results, based on potential biases and imprecisions and suggest areas for future research.                                                                                            | 13  |
| Generalizability       | 16  | Discuss the external validity of the results.                                                                                                                                                                                   | 14  |
| <b>Other sections</b>  |     |                                                                                                                                                                                                                                 |     |
| Role of funding source | 17  | State whether any funding organization has had any roles in the survey's design, implementation, and analysis.                                                                                                                  | 16  |
| Conflict of interest   | 18  | Declare any potential conflict of interest.                                                                                                                                                                                     | 16  |
| Acknowledgements       | 19  | Provide names of organizations/persons that are acknowledged along with their contribution to the research.                                                                                                                     | N/A |

## Supplementary file 2: KAP- Survey questionnaire

All questions are mandatory

### Part 1: Sociodemographic details

1. Unique ID \_\_\_\_\_
2. Age (completed years) \_\_\_\_\_
3. Gender
  - Female
  - Male
  - Others
4. Designation
  - Intern
  - 1<sup>st</sup> year PG trainee
  - 2<sup>nd</sup> year PG trainee
  - 3<sup>rd</sup> year PG trainee
5. Postgraduate department
  - General Medicine
  - General Surgery
  - Obstetrics and Gynecology
  - Pediatrics
  - Orthopedics
  - ENT
  - Ophthalmology
  - Dermatology
  - Radiology
  - Anesthesia
  - Psychiatry
  - Pulmonology
  - Radiotherapy
  - Pathology
  - Community Medicine
  - Pharmacology
  - Microbiology
  - Physiology
  - Biochemistry
  - Anatomy
  - Forensic Medicine

## Part 2: Knowledge domain

Mark only one answer for each question

6. Indiscriminate use of antibiotics in humans, plants and animals leads to antimicrobial resistance

- Yes
- No
- Don't know

7. Approximately 30 % of all hospitalized patients receive antibiotics at any given time

- Yes
- No
- Don't know

8. Lack of rapid diagnostic tests is one of the reasons for irrational antibiotic use

- Yes
- No
- Don't know

9. Limited access to essential antibiotics contributes to irrational antibiotic use and emergence of antimicrobial resistance

- Yes
- No
- Don't know

10. Broad spectrum antibiotics, when used inappropriately, lead to emergence of antimicrobial resistance

- Yes
- No
- Don't know

11. Are you familiar with the WHO AWaRe classification of antibiotics?

- Yes
- No
- Don't know

12. Antibigrams for different hospitals in a region are usually similar

- Yes
- No
- Don't know

13. Hospital antibiograms serve as important tools in guiding empiric antibiotic therapy and tracking resistance patterns

- Yes

- No
- Don't know

14. Metronidazole is effective against infections by anaerobes.

- Yes
- No
- Don't know

15. When clinically desirable, the route of administration of antibiotics may be switched from intravenous to oral due to the following reasons

- Decreases the duration of hospitalisation
- More convenient for patient
- More time consuming in adult patients
- Lesser complications

16. In your opinion which is the most prescribed antibiotic during the COVID-19 pandemic?

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### Part 3: Attitude domain

17. Do you think that your antibiotic prescribing behavior has an impact on the development of antibiotic resistance in your region?

- Yes
- No
- Don't know

18. According to you, who among the following can play a key role in addressing the issue of antibiotic resistance?

Check all that apply

- Doctors/ Prescribers
- Patients/ Consumers
- Nursing/ Paramedical staff
- Community as a whole
- Government or Regulatory authority
- Pharmacists/ Chemists
- Academic/ Research institutions

19. In your opinion, which of the following strategies can help in addressing the issue of antibiotic resistance?

Check all that apply

- Shorter duration of antibiotic therapy
- Reduced non-prescription sale of antibiotics

- Infection control measures e.g. hand hygiene, cohorting etc.
- Antibiotic use restricted to cases with confirmed bacterial infections

20. How much do you agree to prescribing antibiotics on patients' demands?

Mark only one

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

21. Surveillance of antibiotic use and resistance should be done regularly at hospital, local, regional, national and global levels to combat antimicrobial resistance

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

22. There is a rampant use of antibiotics in the hospital I am working

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

#### Part 4: Practice domain

23. Which sources of information do you mostly use while making decisions on antibiotic prescription?

Check all that apply

- Treatment guidelines
- Conferences/ Trainings/ CMEs
- Journals/ Textbooks
- Internet/Social media
- Expert opinions
- Direct communication with colleagues

24. Which factors mostly determine your choice of antibiotics?

Check all that apply

- Culture susceptibility reports

- Availability of antibiotics
- Cost of antibiotics
- Local resistance patterns
- Recommendations from seniors or colleagues
- Recommendations from pharmaceutical companies
- Own experience
- Recommendation from internet
- Patient pressure for antibiotic prescription

25. Do you ever employ delayed/ back-up antibiotic prescribing in your clinical practice?

- Yes
- No
- Don't know

26. How frequently do you counsel the patients regarding appropriate use of antibiotics to prevent emergence of resistance?

Mark only one

- Never
- Rarely
- Sometimes
- Always

27. How often do you change the empiric antibiotic prescribed on the basis of culture sensitivity report?

- Never
- Rarely
- Sometimes
- Always

28. How often do you discontinue the empiric antibiotic in case of negative culture report?

- Never
- Rarely
- Sometimes
- Always

29. How much do you prefer prescribing two or more classes of antibiotics in combination over single agents?

- Never
- Rarely
- Sometimes
- Always

30. How often do you prescribe antibiotics prophylactically without evidence of infection?

- Never
- Rarely
- Sometimes
- Always

31. During last 12 months, did you attend any trainings/ conferences to update your knowledge on antibiotic use?

- Yes
- No