

Saudi Arabia COVID-19 Snapshot Monitoring (COSMO Saudi): Monitoring knowledge, risk perceptions, preventive behaviours, and public trust in the current coronavirus outbreak in Saudi Arabia

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Flexibility and Adaptation

As the COVID-19 pandemic evolves and the epidemiological and response situation rapidly changes, the questionnaire must be continuously updated so that the questions asked to reflect the situation and provide the necessary information to shape effective and appropriate outbreak response measures and next steps.

Aims and Objectives of the Study

The study will be initiated by individual countries with the overall aim **to inform their COVID-19 outbreak response measures, including policies, interventions and communications**. The underlying objectives are:

- Monitor variables that are critical for behaviour change in the population to avoid transmission of COVID-19, including risk perceptions, trust, use of information sources, knowledge as well as barriers and drivers to recommended behaviours
- Document changes over time in these variables to understand the effect of measures taken
- Monitor possible issues related to misinformation and stigma as they emerge to allow for early and rapid response
- Identify relations between variables to assess and define the most effective and cost-effective response
- Explore the relationship of psychological variables (e.g. fear, worry, distance) with the evolution of the pandemic and epidemiological situation
- Identify gaps between perceived and actual knowledge
- Evaluate the effectiveness of pandemic response measures, and the acceptance and effectiveness of policies and restrictions implemented
- Contribute to post-outbreak evaluation, thereby contributing to the continued national/regional/global efforts to better understand mechanisms of crisis response.
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- If additional research capacity is available, the data can be triangulated with data on media reporting, imported or confirmed cases, etc.: The relationship between psychological variables and characteristics of the outbreak situation can be explored (i.e. how closely the perceived risk mirrors reported cases, relative import risk, media reports). Whether it is possible to identify the emergence of certain misinformation as a correlate of risk perceptions can also be explored.

Research Questions

The focus of the research is to inform effective and appropriate outbreak response interventions, policies and messages. Overall, research questions relate to

- Levels of and changes in risk perceptions, knowledge, used and trusted sources of information, confidence in crisis management, correct knowledge about and uptake of preparedness and protective behaviours, at each data collection point;
- How changes in risk perceptions relate to characteristics of the outbreak and other psychological variables such as knowledge, affect and misinformation;
- Whether participants report that they are aware of specific outbreak response measures and whether being aware of them influences risk perceptions;
- Whether risk perceptions are positively related to preparedness and protective behaviours and which other factors are relevant correlates of preparedness and protective behaviours (e.g. knowledge, misinformation, trust);
- Knowledge and misinformation about preparedness and preventive measures and whether the level of knowledge is related to certain sources of information; and
- Reactions to announcements and programs from the national authorities of Saudi Arabia to help combat the COVID-19 outbreak, and its associated effects.

Note that the cross-sectional design will not allow the assessment of actual causal relations and will only be snapshots of a current state of the public perceptions and psychological crisis response.

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- Relationships between psychological variables and characteristics of the outbreak situation (i.e. how closely the perceived risk mirrors reported cases, relative import risk, media reports) will be explored. Whether it is possible to identify the emergence of certain misinformation as a correlate of risk perceptions will be explored.

Study methods

The study will be conducted with an online electronic survey employing convenience sampling technique using an IP-Based duplicate protection system to avoid participants to respond to the link survey more than once. Data will be collected through a 20 minutes web link with adults' citizens (Saudis and Non-Saudis) 18 years and older. Data collection will begin on April 26th, 2020 and will be collected every 15 days. In case of unexpected developments or new response measures implemented, the time frame between the data collections may change. To ensure that the sample is representative of Saud Arabia populations and to allow for analyses of\comparisons between subgroups of interests, each wave will consist of 1100 participants.

Variables

(measured variables, details: see attached questionnaire)

- Demographics (Age, Gender, region, education)
- Awareness of and knowledge about the coronavirus
- Source of first information regarding the coronavirus
- Feeling of preparedness to avoid an infection with the coronavirus
- Perceived self-efficacy
- Knowledge about effective preventive measures to avoid infection with the coronavirus
- Implementation of preventive measures to avoid infection with the coronavirus
- Risk perceptions regarding the disease (probability, susceptibility, severity)
- Affective measures (feeling of closeness, novelty, threat, fear, and worry regarding the disease)
- Perception of the outbreak as a media hype
- Trust regarding sources of information
- Sources of information used
- Trust in health organizations
- Primary source of official health information
- Panic buying behavior

Data Collection and Analysis

Data will be collected through an approximately 20-minute web survey distributed online. A convenient sample will be used. Participants should take part in the survey voluntarily. We plan to do data collection every two weeks with a new, independent sample at each data collection.

An automated data analysis website (password protected) has been established by WHO allowing any Country fast access to the results. Commented code for data analysis and website are available.

Institutional Review Board agreements, ethical standards met and safety monitoring

The study and handling of the data will follow all national required data protection standards. In general, data will be collected anonymously, with no collection of names, phone numbers, email addresses or other information which can identify participants or link participants to data.

Also, participants should provide informed consent before starting the questionnaire. Text on this is included in the questionnaire. The research contains negligible risks as there is no more foreseeable risk of harm or discomfort other than potential inconvenience during participation. The study does not include deception and participants will be debriefed at the end of the survey. The study also involves only non-identifiable data about human beings.

Ethical approval

Also, participants should provide informed consent before starting the questionnaire. The online survey form has text on this, so it is included in the questionnaire. The potential risk of a loss of confidentiality will be minimized by the use of survey identification numbers and the anonymous questionnaire with no personal identifiers at the time of data entry. There are no anticipated risks or discomforts. Findings from this study will provide information for guiding ongoing and future risk communication methods during a pandemic which may positively impact the health of the population. Ethical approval will be obtained from King Saud University IRB committee, the proposal is under IRB review #E-20-4798.

Sample

To obtain a high level of congruence between the distribution of the demographics in the sample and the population (regarding age, gender and living area), a sample size of $n = 1000$ per wave will be used. Each data collection with $n = 1000$ participants will be a quota sample, matching the general population in the country in terms of age, gender and state/administrative region.

Tests

Analyses are integrated in a R.Notebook environment. As all analyses are exploratory and may change based upon requirements of the situation. The data analyses script uses means of descriptive data presentation, regression analysis and correlation analyses.

Only completed data sets will be considered in the analysis. Missing values will be treated as missing values and not be imputed.

Scientific Review and Validation of Tools

Due to the urgency of the need for data, and the rapidly evolving situation (i.e., requiring constant adaptations of the tools used), the protocol and questionnaire have been reviewed and validated based on an ad hoc approach. The documents were originally prepared by Professor Betsch at the University of Erfurt, Germany, and subsequently reviewed by the COSMO group (for more information, see the [WHO Guidance Document](#)). This group represents leading global experts in behavioural insights research for health and in developing and validating survey tools similar to the current. In addition, following two rounds of data collection in Germany, two scientists (Prof. Robert Böhm, University of Copenhagen, Denmark, and Britta Renner, University of Konstanz, Germany) reviewed the data and how it was presented. This review cannot be shared due to the urgency of the situation; it was completed via comments on PDF snapshots of the website where the data was presented. Lessons learned from the implementation in two rounds in Germany have led to continuous adjustments of the questionnaire. To ensure national validation we tested the questionnaire with 30 participants (family, friends, normal people) to estimate the length of participation and if every question was understandable.

Limitations of the study

The urgency of the situation incurs some limitations to the study, including limited opportunities for scientific review and validation, as described above.

This study will be subject to the limitations of cross-sectional surveys, including sampling, response, and recall biases.

In addition, using online surveys limits the participation of certain important population groups, including the elderly (a risk group for COVID-19) and disadvantaged population groups such as migrants, homeless people and other vulnerable groups.

Background: Review of relevant literature

Models of crisis and emergency risk communication (5) suggest that it is crucial to understand the risk perception of the population and the sources of information that they trust to enable effective communication and framing key messages. Messaging should be evidence-based and respond to misinformation and induce rational, adaptive and protective behaviour (6). However, little is known about the complex interplay of changing epidemiology, media attention, pandemic control measures, risk perception and public health behaviour (7). A study conducted during the influenza A(H1N1)pdm09 pandemic in 2009/2010 shows an “asynchronicity between media curves and epidemiological curves (...); media attention for influenza A H1N1 in Europe declined long before the epidemic reached its peak, and public risk perceptions and behaviours may have followed media logic, rather than epidemiological logic” (7). Thus, how people perceive the risk is not necessarily related to the actual risk. This perceived risk, nevertheless, influences protective behaviours (8). Yet, uncertainty about the situation and perceived exaggeration were associated with a reduced likelihood to implement the recommended protective behaviours during the 2009/10 pandemic (9). During the flu pandemic, a perceived inconsistency in recommendations was identified as a critical issue for non-compliance. Exaggeration of risks often happens on social media, where especially highly emotional and often false information are shared (10). While a serial cross-sectional study involving over 13,000 participants during the 2009/2010 pandemic (11) showed that the internet was significantly less used as a source of information than traditional media, this may well have changed over the last decade. For example, the number of monthly Twitter users multiplied by ten from 30 million in 2009 to 330 million in 2019 (12) and Twitter seems to be seen as an alert tool in times of a crisis and a gateway for information (13). Thus, knowledge acquired during the last pandemic is only of limited value to guide crisis responses in the current outbreak.

The coronavirus is new, there is no vaccine or known effective treatment, case fatality rates are still uncertain. Psychologically, this means high uncertainty regarding the likelihood of catching the disease, its potential severity and ability to take control over the process by preventive measure. These perceptions are thus likely to be updated based on changes in epidemiology, media reports, information and misinformation.

As media and communication measures can influence these variables (7)(11) and as these are relevant for preparedness and protective behaviour (5)(14), COSMO aims at monitoring these variables during the current COVID-19 pandemic and to feed them into the communication process during the crisis. COSMO also aims at reliably assess changes and shifts of risk perceptions and to identify the drivers and situations that are related to these shifts. How closely is risk perception related to actual risk? Further, it is important to understand the dynamics of risk perceptions, fears, misinformation and protective behaviours, understand which of the protective measures are known and which information is lacking.

Based on this information it is possible to react to misinformation or suddenly increasing risk perceptions and panics.

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