TECHNICAL REPORT

Norms, beliefs, & practices relevant to the prevention of COVID-19 in the Middle East & North Africa: a literature analysis

JANUARY 2021

Disclaimer

This technical paper is intended to disseminate analytical contributions on the risk communications and community engagement COVID-19 response in Eastern Mediterranean/Middle East and North Africa (MENA) region, which is co-led by World Health Organisation (WHO), UNICEF, and International Federation of the Red Cross (IFRC). The literature review was prepared by Anthrologica, and institutionally commissioned by UNICEF MENA regional office, Communication for Development section.

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This literature review was commissioned by the UNICEF Regional Office for the Middle East and North Africa (MENA) to identify what may influence sustained observance to COVID-19 prevention and risk reduction behaviours in the Middle East and North Africa (MENA) and inform its work on Risk Communication and Community Engagement in response to the COVID-19 crisis.

The literature analysis was conducted by Anthrologica in May-August 2020. The research team comprised Olivia Tulloch (consultancy lead), Nadia Butler (principal author and research lead), and Soha Karam (Arabic language research lead).

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Executive summary

Purpose and objectives

This literature review identifies factors which may influence sustained observance to COVID-19 prevention and risk reduction behaviours in the Middle East and North Africa (MENA). The work was commissioned by UNICEF Middle East and North Africa Regional Office (MENARO). The review and its recommendations are designed to be of operational use to UNICEF and partners, and all relevant actors, with regard to the design of effective context-relevant risk communication and community engagement (RCCE) strategies, guidance and tools and to identify areas for further research, in the specific context of the Middle East and North Africa.

The review focuses on social and cultural barriers and enablers to a number of practices relating to prevention, detection and response to COVID-19. Specifically: effective hand and respiratory hygiene; physical distancing, immunisation, testing, case reporting, contact tracing, health-seeking, antenatal and PNC care-seeking, quarantine and isolation, home-based care and shielding of high-risk populations. These practices or public health measures have been variously recommended or mandated by governments and international organisations across the region. They were identified as key practices for the prevention of subsequent waves of COVID-19 as restrictions and lockdown measures are eased.

Methods and conceptual framework

A ‘structured’ review of the scientific literature was carried out and analysed using a thematic synthesis methodology. Published scientific literature relating to all 20 countries in the region was accessed in English, Arabic and French. The scientific data were complemented with grey literature, media reports and perception data to provide additional insight into current events and perspectives in the region.

The Behavioural Drivers Model (BDM) was used as a framework for conceptualising the relevant behavioural influencers. The Model groups all behavioural drivers into three main categories: psychology, sociology and environment.

Summary findings

Human behaviours can be hindered or enabled by multiple drivers: personal characteristics or psychology of the individual; social influences, norms and pressures in society; and features of the broader environment or context of which an individual is a part. Although the review focused on a large and diverse region, some patterns emerged, due to commonalities of culture, religion, state-citizen relations and displacement of peoples. These findings should be viewed as a starting point for more contextualised formative research on specific populations. A limitation of the study was a lack of published data in some thematic areas and an imbalance in the amount of data for each country, making it difficult to draw conclusions about pan-regional influencing factors.

Personal characteristics

Personal characteristics contributing to low compliance with the relevant public health measures across populations included male gender, lower education level, age (both older and younger), and rural location. In the case of gender, it was evident that men's usual social and professional or labour activities led them to leave the home more often and socialise more frequently, which had implications for distancing and quarantine. In general, studies have also found that men tend to be more prone to taking risks and less likely to adopt preventive behaviours than women. Knowledge level, in itself a predictor of compliance, had similar influencing factors to compliance levels. Lower knowledge was associated with male gender, lower education, lower income, rural location, and older age.

Context

Displacement and migration exacerbate difficulties faced by the general population in following recommended basic protective measures, including handwashing, maintaining physical distance and isolating at home, due to their often crowded and precarious living conditions. Religion featured as both an enabler and a barrier to various behaviours. While religious beliefs about disease origins and treatment can be a barrier to the adoption of certain behaviours, religious teachings in line with public health measures can be harnessed, and religious institutions have shown flexibility and adaptability in interpreting scripture in a way that is synchronised with public health requirements. In addition, populations facing multiple challenges or emergencies may not prioritise COVID-19, since the disease may be considered an insignificant threat compared to that of the hunger, poverty, homelessness and desperation they may be experiencing.

Psychology

Interest, attitude and self-efficacy featured as important drivers for many risk behaviours. People's perceived risk of a practice (e.g. risk of side-effects from vaccination, losing income as a result of quarantine) weighed against the potential gains (not getting sick, not being stigmatised) and contributed to their level of interest in carrying out the practice. People's values (such as a desire to "do the right thing"), alongside their emotions (e.g. fear of getting sick, disgust at having dirty hands) were also important influencers. In terms of their self-efficacy, people's emotional wellbeing and 'decision autonomy' contributed to their likelihood or ability to decide to take a particular action (e.g. people who relied on family members to make decisions were prevented from accessing healthcare). Awareness and knowledge were underlying drivers to all of these factors. Lower knowledge levels around COVID-19 were generally associated with lower rates of compliance. Differing understandings of disease aetiologies or lack of knowledge about infectious disease influenced behaviours around treatment and prevention for infectious diseases.

Sociology

Social influence and meta norms were key drivers for some behaviours. People were driven by social norms and social pressure to practise measures such as handwashing. Role models (whether positive or negative) were strong influencers, as were stigma and discrimination. For example, children washed their hands to avoid being stigmatised by other children, while Afghan migrants in Iran experienced reduced access to healthcare because of stigma. Meta-norms, including gender ideologies, power dynamics and moral norms were also key drivers.

For example, women in the MENA region are more likely to stay at home than their male counterparts and are also more likely to require input from family members (especially male) on decisions about their actions. This has implications for practices such as complying with quarantine or curfew, and for health-seeking. Moral norms related to religion were a strong driver, and could act as both a barrier or an enabler to certain practices.

Environment

Structural factors, including access and quality of services and resources, living conditions, infrastructure and trust in governing entities were key themes affecting compliance. Access to resources such as soap, water and sinks for handwashing or COVID-19 test kits had implications for whether people could carry out these practices. Lack of functioning or accessible health services, particularly in conflict settings, had implications for healthseeking and case reporting behaviours. Overcrowded living or working conditions, as well as overcrowding in mass prayer gatherings, had implications for distancing and hygiene, as well as people's abilities to quarantine or self-isolate. Meanwhile, the level of popular trust in the government emerged as a key theme influencing compliance with COVID-19 prevention measures. In the Gulf countries, there tends to be a high level of trust in the government. In other countries, a lack of transparency, the curtailment of free speech and the expansion of state powers in the context of COVID-19 have exacerbated historical state-public mistrust and consequently led to a disinclination of people to follow government-directed prevention measures. The communication environment, and people's access to factual and scientific information that is accurate, timely and communicated by trusted sources and though trusted media is key. Public figures, and particularly religious leaders, have often been key to promoting specific behaviours to the population. Awareness campaigns, by both governments and external cooperation, have been found to be effective in promoting certain behaviours.

Translating findings to recommendations and considerations for RCCE and further research

As restrictions to manage the pandemic have evolved, there has been tendency for people to relax and become complacent about following preventive measures. Complacency will need to be managed, and sustainable, long-term preventive practices fostered in the long term. RCCE strategies will need to continue to provide information about the level of risk and encourage people to continue to practice behaviours to protect themselves and others. Risk communication approaches and content as well as community engagement strategies will need to adapt from a context of emergency and uncertainty to one of status quo, encouraging sustainable, habitual behaviour. RCCE will need to contribute to shifting social norms and maintaining and supporting those new norms over time.

Substantial efforts have been made to share information on COVID-19 at large scale. These efforts are most effective when there is strong ***understanding of contexts, people, behaviours and practices*** including systematic measurement of behaviour change. The following recommendations have been developed from the literature review and should be considered in efforts to design RCCE strategies to contain and manage COVID-19 in countries across the MENA region. Due to the broad nature of the review, these recommendations are pan-regional, not country- or population-specific. They should be seen to be a starting point for further research that could provide more granular and nuanced consideration of issues in specific contexts.

Formative research and monitoring for strategies or interventions in some populations is needed.

The review found that available evidence was skewed towards some countries in the region and certain thematic areas. There were limited data from the Maghreb region, and the large migrant populations in the GCC. Adoption of preventative health behaviours is correlated with perceived risk of COVID-19, and perceptions of risk are also variable. For many in the region, COVID-19 is not their upmost priority and it is difficult to incorporating restrictive public health measures into their daily lives. Lower awareness and compliance with protective measures was identified in some groups. Overall men were more prone to taking risks and specific strategies should be considered to address this. While structural factors such as the need to work must be considered, it may also be useful to appeal to a sense of social responsibility, such as their role in protecting female or elderly members of their families. Specific interventions should also be designed to engage **young people** who perceive themselves to have limited risk, highlighting the risks but also incorporating the notion of social responsibility and their collective duty to protect all community members. In addition, specific attention is needed for key vulnerable groups: the **elderly**, those with **lower income** and those with a **lower education** level, **refugees, IDPs and migrant**s. People's priorities, practices and behaviours are constantly evolving and information related to this will need to be regularly updated.

Recommendations:

1. Prioritise research to fill gaps in knowledge gaps, including: i) the causes of vaccine hesitancy in the region and attitudes towards the new vaccines; ii) understanding behavioural influencers relating to detection and response measures: e.g. testing, case reporting and contract tracing, quarantine; iii) under-represented geographic and thematic areas.
2. Invest in ongoing monitoring and evaluation and acknowledge that behavioural changes are not only a result of RCCE but are also linked with the access to and quality of service delivery.
3. Complement existing survey data with in-depth qualitative research with different population groups where feasible and appropriate (e.g., in-person focus group discussions and interviews and telephone interviews as well as the existing online surveys and polls).
4. Evidence generated should then be used to develop targeted strategies for high risk and vulnerable groups: identify the level at which to interventions should be targeted (e.g. individual, household, community, broader society) and the various entry points. In some cases it may be appropriate for interventions to be multilevel and multi-pronged.

RCCE should be relevant to the target group: Understand the communication environment and harness social media.

For each target group, it is important to take time to find out what they already know, what information they are lacking and what they would like to know more about. In this way, messages will be relevant and useful and message fatigue can be avoided. Different groups have different communication preferences, social media has high penetration in some parts of the region and can effectively reach many people, yet some population groups, such as migrant workers, may have lower online access. When targeted carefully to the needs of different groups social media can have considerable potential for strengthening risk

communication and public health promotion. As well as 'pushing' information, social media can be effectively used to gather information and to conduct rapid polling.

Different groups also have diverse concerns, for example it may be important to communicate to refugees that they can access medical assistance even if they lack legal residence, while, in economically vulnerable groups it will be important to provide information to people about how they can comply with protective measures without jeopardising their livelihoods.

Recommendations:

1. Local assessments should map the communication ecosystem in conjunction with analysis of the local political economy. This should include people's favoured channels, trusted sources of information, levels of literacy, health literacy and media literacy, the ways in which different groups prefer to and are able to receive and share information.
2. Mapping should include the potential use of digital RCCE strategies as well as effective ways to communicate with population groups with low levels of digital literacy.
3. Avoid standardised interventions (e.g. broad awareness campaigns) that do not address the specific barriers or enablers relevant to a specific behaviour for a specific group of people in a specific context. Communications about risk should be as closely tailored to individual groups as is feasible.

Social norms can be harnessed to enable positive behaviours: Capitalise on best practices, identify trusted voices and work with people's faith

As well as addressing **barriers** to risk communications and community engagement, attention should be paid to **enablers** as well. In general, people behave in ways they believe to be acceptable and expected by others in their society. For example, if improving hand hygiene is the goal, it is possible to design interventions that increase the perceived social support for handwashing. Positive social norms and values can be encouraged and harnessed (such as respect and protection for the elderly), while norms that pose more of a risk, such as sharing hoses during waterpipe smoking, can be addressed by explaining the risks and proposing alternative behaviours that will be acceptable to people.

It is important to identify trusted experts and social influencers (who are often more trusted than official sources). With regard to religion, for example, Islam has strong and highly relevant teachings about quarantine, isolation, hygiene and health-seeking. Religious teachings can be harnessed to encourage people to voluntarily adopt positive behaviours in line with their faith. Religious leaders have an essential role in how people interpret and apply religious teachings. They can help to ensure that effective measures of infection prevention and control are set at places of religious congregation, within family homes, and a range of public settings.

Careful consideration needs to be given to power relations, spheres of influence and potential conflicts of interest. This is particularly important in those parts of the region where there is poor trust in the state or poor public-state relations. In some contexts, it may not be appropriate to engage with religious leaders and the religious and political context (both nationally and at the sub-national level) must be taken into account. Other successful influencers in the region included television celebrities, health workers, government officials

and peers. These stakeholders can help dispel mis- and disinformation and can be involved in constructive communication

Recommendations:

1. Develop a structured approach to document and share evidence on what has worked well (and less well) and why. It should include analysis of strategies and targeted actions that have worked at scale or have potential to work ***at scale***, as well as assessment of strategies that have been targeted to ***localised needs*** and priorities, including engagement with different vulnerable and marginalised population groups.
2. For each target group, to map the key trusted influencers and interlocutors and engage with these multiple stakeholders.
3. Craft messages from within groups, not extraneously, and with actors who have the legitimacy to speak to the group and to redefine norms or realign beliefs with practices.

People should be active agents of health prevention, detection and response: Invest in the rapid operationalisation of community feedback

It is essential that the priority needs and concerns of communities are at the forefront of response interventions. Levels of trust in the state are variable in the region, and locally specific community engagement efforts must respond accordingly. Low levels of trust have been attributed to the failure to provide opportunities for people to be involved in the decisions that affect them. Trust can be reinforced by community engagement but takes time to build, so where possible community engagement should build on initiatives that are already successful, following the accepted principles of encouraging two-way dialogue, creating space for people to ask questions and for their needs and involvement to be reflected in future engagement. This is particularly relevant in fragile contexts where trust in public authority has been eroded. In the context of a pandemic, some decisions need to be made quickly and at the central level, but it remains important to continuously seek and use opportunities to meaningfully involve communities and identify locally appropriate solutions. RCCE strategies are likely to be more successful if they are co-designed through community-centred approaches, capitalising on already existing local knowledge and networks.

Recommendations:

1. Assess the level of community engagement in the response; collect community feedback systematically and frequently and use it to adapt and improve RCCE strategies, and service. Where necessary review how information is collected and conveyed, and the relevance of information in circulation.
2. Evaluate gaps by triangulating information from different sources to identify common trends in perceptions, behaviours and knowledge and how these can be addressed. Defining overarching themes and modalities for data collection in line with key indicators will further help to ensure data collected is usable and useful.
3. Aim to build a high level of engagement and not be extractive, particularly when interacting with population groups who are already under substantial pressure. Involve local actors and frontline workers in the analysis of data to ensure findings are appropriate and applicable. findings should be disseminated findings and used.

Ensure credible sources and types of information: identify misinformation and disinformation and address stigma.

Communications are most effective when they are solution-focused, and promote self-efficacy, hope and agency. Building on existing strengths can help mitigate fear and foster compliance with public health recommendations. Mis- and disinformation proliferate in disease outbreaks and a lack of scientific evidence can create a vacuum that is filled by speculation. Rumours often reflect underlying anxieties or pre-held social or political positions and beliefs and it is important to appreciate and address their underlying causes. It is useful to consider the extent to which different population groups are able to adapt to (constantly) evolving guidance and how they deal with conflicting information. Stigma around COVID-19 has emerged as a deterrent to practices such as testing, case reporting and healthcare seeking. There are numerous examples of specific populations and minorities being singled out and labelled as carriers of the disease. The language used in communication campaigns matters.

Recommendations:

1. Identify and address incorrect information rapidly, this can be very effective and creates space for reliable information to circulate.
2. Foster honest and consistent dialogue about new evidence and knowledge.
3. Formulate information and messaging that avoid the stigmatisation of certain groups.

Secondary impacts of COVID-19 measures are disproportionate for some people: Support vulnerable groups

It is important to address the wider (secondary) impacts of COVID-19, how these may affect the population over time, and how longer-term negative impacts may be mitigated. Meaningful communication should acknowledge local realities as people may be facing multiple crises. Considerations of risk must include dimensions beyond biomedical risks and take account of risks associated with health, behaviour, socio-economic realities, psycho-social impact and the policy environment. In the case of supporting **adolescent refugees**, for example, various activities have been recommended including providing information about financial support, establishing hotlines to discuss violence and abuse, incorporating positive coping strategies across programmes (e.g., to avoid alcohol and drugs) and supporting youth to be involved in volunteer activities. For vulnerable people to be willing to **shield themselves from social contacts**, high-risk individuals and the communities they live in must trust in the public health response and be supported. In the MENA region it is important that the wider community acts as a support system in any shielding or homecare efforts. Effective communication between caregivers at home and health professionals is essential to ensure adequate care if being provided and to link with referral services. Protecting vulnerable people remains extremely complex **for displaced people living in camps** and it is essential that they are fully and effectively engaged in discussions relating to the public health measures that affect them.

Recommendations:

1. Pay attention to the secondary effects of public health measures, which may act as a deterrent to compliance.
2. Identify and communicate risks specific to population groups and particularly those who are shielding or being cared for at home.

3. Carry out research on the secondary health impacts of COVID-19 and the corresponding shifts in people's health-seeking behaviours for other acute and chronic illness.
4. Take into account people's psychosocial wellbeing and consider including messages that offer ways to improve and maintain this.

Work towards regional cooperation and collaboration

Noncompliance and complacency towards COVID-19 measures have been observed globally. The pandemic has highlighted geo-political tensions and the economic impact is stark. COVID-19 has identified the need for strengthened global coordination and collective action for a coherent response. This is even more important between MENA countries, as it is a region where commonalities can be used to the advantage of all. Shared goals and consistent approaches to communication and particularly community engagement should be mutually reinforcing among key population groups with shared cultural, social or religious values, and these can then be further tailored to the most local context as appropriate.

Recommendations:

1. RCCE partners should share information in a timely manner and agree joint approaches to collaborate with other response pillars and decision-makers, creating positive collective action.
2. Multi-agency platforms should be used to develop communication about emerging evidence that can be furthered tailored to local contexts.

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Abbreviations

ACAPS	Assessment Capacities Project
ANC	Antenatal care
ARI	Acute respiratory infection
BDM	Behavioural Drivers Model
COVID-19	Coronavirus disease 2019
EBSCO	Elton B. Stephens Company
GCC	Gulf Cooperation Council
ICU	Intensive care unit
ID	Identification card
IDPs	Internally displaced persons
IFRC	International Federation of Red Cross and Red Crescent Societies
IPC	Infection prevention and control
KSA	Kingdom of Saudi Arabia
LGBTQ	Lesbian, gay, bisexual, transgender, queer or questioning
SARS-CoV-2	Severe acute respiratory syndrome coronavirus 2
MENA	Middle East and North Africa
MERS-COV	Middle East respiratory syndrome coronavirus
PNC	Postnatal care
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-analyses
RCCE	Risk Communication and Community Engagement
SEM	Socio-Ecological Model
UAE	United Arab Emirates
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
WASH	Water, sanitation and hygiene
WHO	World Health Organisation

1. Introduction

At the end of January 2020, the outbreak of the novel coronavirus (SARS-CoV-2) was announced as a Public Health Emergency of International Concern by the World Health Organization. Since then, efforts to contain the virus, which causes COVID-19 disease, have put major restrictions on daily lives worldwide. Populations are increasingly fatigued and frustrated with the prolonged and severe measures, yet while there is no effective treatment or vaccine for COVID-19 on the near horizon, sustaining adherence to public health measures, restrictions and preventive behaviours will continue to be necessary.

Risk communication and community engagement (RCCE) is an essential part of responding to infectious disease outbreak and reducing the transmission of infection. It is done through dialogue and exchange of information about how to reduce risk of infection; promotion and advice about prevention practices; and mitigation of psychosocial impacts. The chronic nature of this pandemic and the changing evidence relating to the new virus creates new challenges for RCCE.

Purpose of the review

This report presents a review of scientific literature that identifies social and culture influencers and predictors for the sustained practice of COVID-19 prevention and risk reduction behaviours in the Middle East and North Africa (MENA) region. It is intended for use by UNICEF and partners in the design of effective context-sensitive RCCE strategies, guidance and tools to prepare and support populations to prevent and respond to COVID-19.

The review looks at meta-norms, cross-cultural practices and other pan-regional factors that may influence the adoption of protective behaviours. It draws on the existing scientific literature, but it should be noted that qualitative literature relating specifically to COVID-19 remained limited at the time the review was conducted (September 2020). The review focused on identifying barriers and enablers related to the following thematic areas:

- Effective hand and respiratory hygiene
- Physical distancing
- Immunisation
- ANC and PNC care-seeking
- Testing, case reporting & contact-tracing
- Health-seeking
- Quarantine and isolation
- Home-based care
- Shielding of high-risk populations

Secondary effects of public health measures were not the focus of this review, except to the extent that they were found to influence the adoption and sustained practice of relevant behaviours.

The review assumed a pan-regional approach, but highlighted country and population differences and learning where significant or relevant. The countries included in the review were: Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, the Kingdom of Saudi Arabia (KSA), Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Sudan, Syria, Tunisia, the United Arab Emirates (UAE) and Yemen.

This report provides contextual background information on the region, presents a synthesis of findings from the literature and sets out implications and recommendations drawn from these. Overall the report is intended to a) guide the direction RCCE efforts to contain the virus; b) inform regional level operational guidance, standards and tools to strengthen implementation, monitoring and evaluation; and c) identify further areas of research that may require primary data collection. A full list of documents included in the review and methodological tools used are included as annexes.

COVID-19 in the MENA region

The MENA region is highly diverse, incorporating low-, middle- and high-income countries at various stages of the demographic transition, and with several on-going and large-scale emergencies. In some parts of the region, existing conditions create specific challenges for the response to COVID-19. For example, intensive care units (ICUs) are required to treat severe COVID-19 infection but are severely limited in several countries.[1] In general, many MENA countries continue to suffer from shortages in medical equipment and physicians. WASH services are also scarce, especially in countries that have experienced recent conflict, where fragile governance, violence, and limited healthcare infrastructure have made the coordination of delivery of supplies and treatment difficult.[2] WHO estimated that by the end of 2019 in Syria, only 64% of hospitals and 52% of primary healthcare centres were fully functional and up to 70% of the healthcare workforce had left the country.[3]

Nearly every country in the MENA region currently hosts refugees and/or internally displaced populations (IDPs). This is a major concern for the response to COVID-19. Many refugees and IDPs live in densely populated camps, with close quarters and limited access to WASH services. Physical distancing is very difficult to implement and enforce in these conditions. Medical care, contact tracing, and methods of detection are also lacking within these populations.[2] A large percentage of the populations of the Gulf Cooperation Council (GCC) countries are migrant workers, predominantly from Asia and to a lesser extent, Africa, as are many in Jordan, Lebanon and the Israeli settlements. In some countries, migrant workers make up the majority of the population (more than 80% in Qatar and the UAE.[4,4] They often live and work in crowded conditions and lack access to support and healthcare.

SARS-CoV-2 was detected across all the countries in the region between early February and early April 2020. Incidence of cases and the number of deaths from COVID-19 have varied greatly between countries, but as of late August 2020, 1.8 million confirmed cases and 48,105 deaths had been reported across the region.

All 20 countries in the MENA region introduced measures to reduce transmission of SARS-CoV-2. As elsewhere in the world, such measures have had some success, but have also led to substantial negative socio-economic impacts. Nearly every country implemented policies limiting travel for commercial flights and city transportation.[5] Initial response policies saw school closures in all countries, affecting around 110 million students. While this closure was important for limiting the spread of COVID-19, it not only had a profound impact on education but may have created greater food insecurity for children dependent on school feeding programmes. The extensive confinement measures introduced also contributed to increasing the already high rates of domestic violence in the region.[5]

As cases spread, countries started to suspend religious services and close non-essential businesses. Curfews were implemented early on in the United Arab Emirates, Saudi Arabia, Libya and later, Sudan. Many countries created spaces for testing and expanded the number of ICU rooms and beds in an effort to keep up with caseload.[5] Several countries had significantly slower responses, turning them into epicentres for viral spread, or continued with potentially high-risk events, such as the parliamentary elections held in Iran in February.[5] After the initial months of lockdown and quarantine measures, several countries outlined plans to 'open back up' as early as May 2020; and over the summer months, Jordan and Qatar also published detailed plans outlining phases and goals for reopening.[7,8]

Report structure

Following this introduction, Section 2 of the report outlines the methodology and conceptual framework used to conduct the review of scientific literature. The key findings of the review are presented in Section 3 and against the backdrop of the diverse contextual factors described above. Drawing on the analysis of the literature, Section 4 details the implications of the findings for RCCE and presents recommendations for further primary research. Throughout, the report follows the broadly accepted principles of RCCE, specifically that it: understands behavioural and social drivers and regularly listens to community feedback; provides timely, relevant and actionable life-saving information; uses innovative approaches to encourage behaviour change; identifies and supports community-led solutions; ensures the accountability of the response; and promotes health seeking behaviours and demand for bio-medical solutions to control the outbreak. These principles and outlined in the forthcoming COVID-19 Global RCCE Strategy being developed by Inter-agency RCCE Working Group.

2. Methodology and conceptual framework

Methodology

This section summarises the methodology and approach used to conduct the review of scientific literature. The full methodology is presented in Annex 1.

The review was a 'structured' literature review. This approach follows a rigorous process that includes defined study selection and inclusion and exclusion criteria, but does not seek to identify and incorporate every relevant paper or document. Rather, it focuses on the synthesis being thematically comprehensive, with the final synthesis presenting all relevant themes that could have been identified ('conceptual saturation'). The review was comprised of five steps.

Step 1. Defining the research questions

The primary research question guiding the literature review asked "what are the socio-normative influencers and cultural predictors for the sustained practice of COVID-19 prevention and risk reduction behaviours in the MENA region?" Targeted research questions were asked about specific measures to prevent, detect and respond to COVID-19, these focused on behavioural influencers that may act as either barriers or enablers to the adoption of these measures (summarised in Table 1). For each measure two questions were asked: "what behaviours exist or are emerging relevant to the measure?"; and "what factors influence or predict behaviour relevant to the measure?" These questions formed the basis of the search terms and inclusion criteria.

Table 1: Selected prevention detection and response measures

Prevention

• Hand and respiratory hygiene
• Decontamination of surfaces
• Cough etiquette
• Use of masks/face coverings
• Physical distance
  - Non-contact greetings
  - Maintaining a given distance between individuals
  - Social gathering
  - Staying at home or avoiding public places
• Immunisation

Detection
• Testing • Reporting cases • Contact tracing • Health-seeking   - Antenatal and postnatal care-seeking

Response
• Quarantine and isolation - Voluntary quarantine - Enforced quarantine - Voluntary isolation - Enforced isolation • Home-based care / shielding - Home-based care - Home-based infection, prevention and control - Protection of the elderly - Protection of those with underlying health conditions - Protection of pregnant women

Step 2. Literature search

Academic literature was accessed in English, Arabic and French. Published qualitative and quantitative academic studies were included, as were pre-prints and unpublished studies. This was complemented by a rapid review of grey literature and relevant media coverage. Two search string formulae were used:

Search string formula 1 = Geographical area term + Prevention, detection or response measure term + Context term

Search string formula 2 = Geographical area term + Prevention, detection or response measure term – Context term

Grey literature produced since the COVID-19 pandemic began was sourced from implementing partners, organisations and other specialist research repositories. Documents included global, regional and national guidance and action plans (where available) for the 20 countries within the MENA region, country specific programmatic material, risk communication and community engagement strategies, social behaviour change communication strategies, and unpublished contextual research.

Media coverage was reviewed for information on current behavioural trends and perceptions relevant to COVID-19 prevention and risk reduction strategies in the region. National and international online news outlets were searched in English and Arabic, and general Google searches were performed using search terms adapted from the above table to elicit further relevant articles. These articles were not included in the formal review for data extraction, but were used to complement the review and to triangulate the data from the academic literature synthesis. In selecting media articles, a judgement was made about the quality of the article, taking into account impartiality of the author, the extent to which findings were supported by evidence, and the extent to which the findings contributed to the research question.

Social Media. Where available, secondary analyses of social media content and perception data was accessed to complement the formal review of literature. This provided greater insight into current public behaviours and perceptions relevant to COVID-19 prevention and risk reduction strategies in the region.

Step 3. Literature selection and screening

The literature selection and screening process was carried out using an adapted version of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart.[195] Phase 1, title and abstract review, yielded a total of 613 distinct articles, of which 105 were in Arabic, three were in French and the rest were in English. In Phase 2, full-text review, 276 articles were taken forward. In phase 3, 124 studies were selected for data extraction and after their quality appraisal in phase 4, 115 articles were finally included in the review (24 in Arabic, 88 in English and 3 in French. As there was less Arabic language literature available, in some cases relevant essays and media articles were included in the Arabic literature sample.

Step 4. Data extraction and coding

The full text of each selected document was read in detail. Relevant data was extracted, coded and populated the review's data extraction matrix. For the English literature, the lead researcher and a second researcher worked in tandem to extract data and populate the review's data extraction matrix against agreed codes. The two researchers cross-checked samples and compared coding to ensure the process was consistent. Any inconsistencies were resolved, re-coded and new codes mutually agreed as relevant. One researcher extracted and coded the Arabic literature, and another extracted and coded the French literature, but all three researchers collaborated closely to ensure coding was consistent across the dataset, and any code changes agreed.

Step 5. Synthesis of data

Descriptive themes were identified to categorise behavioural influencers according to the Behavioural Drivers Model (BDM), described further below. Adjustments were made to some of the BDM categories and additional categories added. The data were then synthesised with a view to identifying and articulating the overarching barriers and enablers that influence and predict the sustained practice of prevention, detection and response measures in the region in a way that will be of operational value to UNICEF and partners, with a particular focus on RCCE. In order to triangulate findings, a number of additional articles were consulted during the synthesis exercise. These included relevant articles identified in the reference lists of selected studies, and documents identified through the grey literature search and forwarded by partners and media articles.

Conceptual framework

The Behavioural Drivers Model (BDM)[9] was used as a framework for conceptualising the relevant behavioural influencers for the sustained practice of the various prevention, detection and response measures. The BDM was designed by UNICEF MENARO to guide social and behaviour change programme design and operationalisation, and as such provides a useful frame for translating research findings into recommendations of operational value.

The model "considers behaviours to be the complex result of the influence of multiple determinants, in a socio-ecological approach."[9] It groups behavioural drivers into three main categories:

- Psychology (individual cognitive and emotional drivers)
- Sociology (interactions within families, communities, groups and society at large)
- Environment (structural elements such as institutions, policies, systems and services, infrastructure and information).

In addition to these categories are personal characteristics and context, which are cross-cutting. Under each of these categories, drivers are organised according to two levels of depth:

- Level 1 drivers (factors)
- Level 2 drivers (the various dimensions that make up each of the factors).

The BDM considers behaviours to be the result of the influence of multiple factors – personal, social and environmental – originating across multiple layers. It is therefore aligned with the Socio-Ecological Model (SEM) of behaviour change, which provides a way of considering the various layers of influence that surround an individual. The SEM is based on the concept of ecosystems, and "examines the dynamic ways that different layers of the social sphere influence each other".[10] The layers of the model are often adapted depending on the context. In relation to this review, the nested layers of influence are understood to be:

- Individual
- Household (reflecting the importance of the household during times of confinement, and acknowledging that household does not always equate to family)
- Community (usual interactions with friends, neighbours, workplaces, schools, shops, local officials, community organisations, non-governmental organisations)
- Broader society and environment (including the wider social, political and economic systems that form the backdrop to people's lives and which interact with the other levels. The regulatory, policy and legal environment is also included in this level).[10,11,12,13]

The BDM can be broadly mapped onto the above SEM levels: the BDM's category of psychology corresponds to the SEM's individual level; the BDM's category of sociology corresponds to the SEM's household and community levels; and the BDM's category of environment corresponds to the SEM's level of broader society and environment. We present reflections on the use of the model in Annex 2.

Study limitations

The first limitation of the review resulted from the fact that socio-behavioural studies relating to COVID-19 in the MENA region were not yet widely available at the time of the study. The COVID-19 pandemic was first reported only six months prior to starting the review, meaning there was a limited literature available of direct relevance to COVID-19. This review was therefore designed to include a broad range of literature from before the pandemic and to apply learning to the current situation.

The second limitation was related to the overrepresentation of online surveys and quantitative studies in the existing COVID-19 literature. This is largely because of the constrained research context in which primary data could be collected, often during conditions of lockdown and restricted travel. The online quantitative surveys tended to shed light on current self-

reported behaviours, attitudes and intentions, but provided little insight into the underlying drivers to these behaviours. More in-depth qualitative studies are underway in many places but had yet to be published at the time of the review. Qualitative data were only available for contexts other than COVID-19, meaning that rich granular detail that may have shed light on the drivers behind people's behaviour specifically related to COVID-19 remains scant.

Much of the COVID-19 literature had been hastily compiled in an emergency context and was of medium and sometimes low quality. To overcome these limitations, and in addition to accessing data about relevant behaviours from prior to the COVID-19 pandemic, the formal review was complemented with additional grey literature, media reports and perception data to gain greater insight into some of the potential underlying drivers and contextual factors influencing people's behaviours. Strong themes identified in the mainstream media reports (e.g. lack of trust in the government) did not emerge so strongly in the academic literature, largely due to the nature of the studies and the questions asked.
All material was carefully appraised prior to inclusion, and whilst some relevant material was included even if it was not always of the highest quality, it was used as background and was not forefront in the analysis that remained rooted in the academic scientific literature.

The third limitation arose because the evidence presented in the available literature is skewed towards certain countries and methods. The list of documents included in the final review is presented in Annex 3 and arranged by country. There was an unequal distribution of scientific literature across countries, with proportionately more studies originating in Saudi Arabia, Egypt and Iran while other countries were poorly represented in the literature. Similarly, there was more evidence available relevant to some themes (e.g. handwashing) than others (e.g. testing, case reporting, contact tracing). In addition, the evidence presented was at times contradictory within and between settings.

3. Literature Review

This section presents the detailed literature review of the social and cultural influencers of COVID-19 protective behaviours. It is arranged according to the overarching themes in the Behavioural Drivers Model. The themes (Level 1 and Level 2 drivers) that emerged and re-emerged in the analysis of the literature are listed in Table 2 below.

After a summary of the evolving RCCE response, the key themes influencing prevention, detection and response behaviours are detailed in relation to personal characteristics, context, and the three BDM categories psychology, sociology and environment. Findings related to barriers and enablers for specific prevention behaviours (handwashing; surface hygiene; use of masks and face coverings; cough etiquette, contact greetings, limiting gatherings, staying at home, individual spacing, immunisation), detection behaviours (testing, case reporting and contact tracing; health seeking and antenatal and postnatal care seeking) and response behaviours (quarantine and curfew; isolation; and home-based care and protection of people at high risk of adverse outcomes from COVID-19) are then presented. Throughout, summary RCCE and research considerations are highlighted in boxed text. Further discussion about how the drivers intersect at the different levels of the socio-ecological model and the application of this model is included in Annex 2.

In analysing drivers relevant to specific practices, it is important to highlight that influencers vary between countries and within populations and that gaps in the data mean that the picture of behavioural influencers is incomplete. Patterns did emerge, however, due to commonalities in culture, religion, state relations and displacement. Findings from the literature review should therefore be seen as a starting point, with contextualised formative research a necessary pre-requisite for the design of specific localised interventions.

The evolving RCCE response

Public awareness campaigns have been launched throughout the region and non-state actors and civil society continue to make important contributions to RCCE efforts, although comprehensive documentation of these efforts is beyond the scope of this review. Global, regional and national RCCE strategies for COVID-19 are evolving as well as strategies for specific populations. Most countries have created websites through their Ministry of Health that update citizens on information related to COVID-19 in their country in order to counter the plethora of misinformation.[2] Social media platforms have been widely adopted as part of national communication efforts in several countries.[14,15,16] Illustrative examples of state-led efforts include:

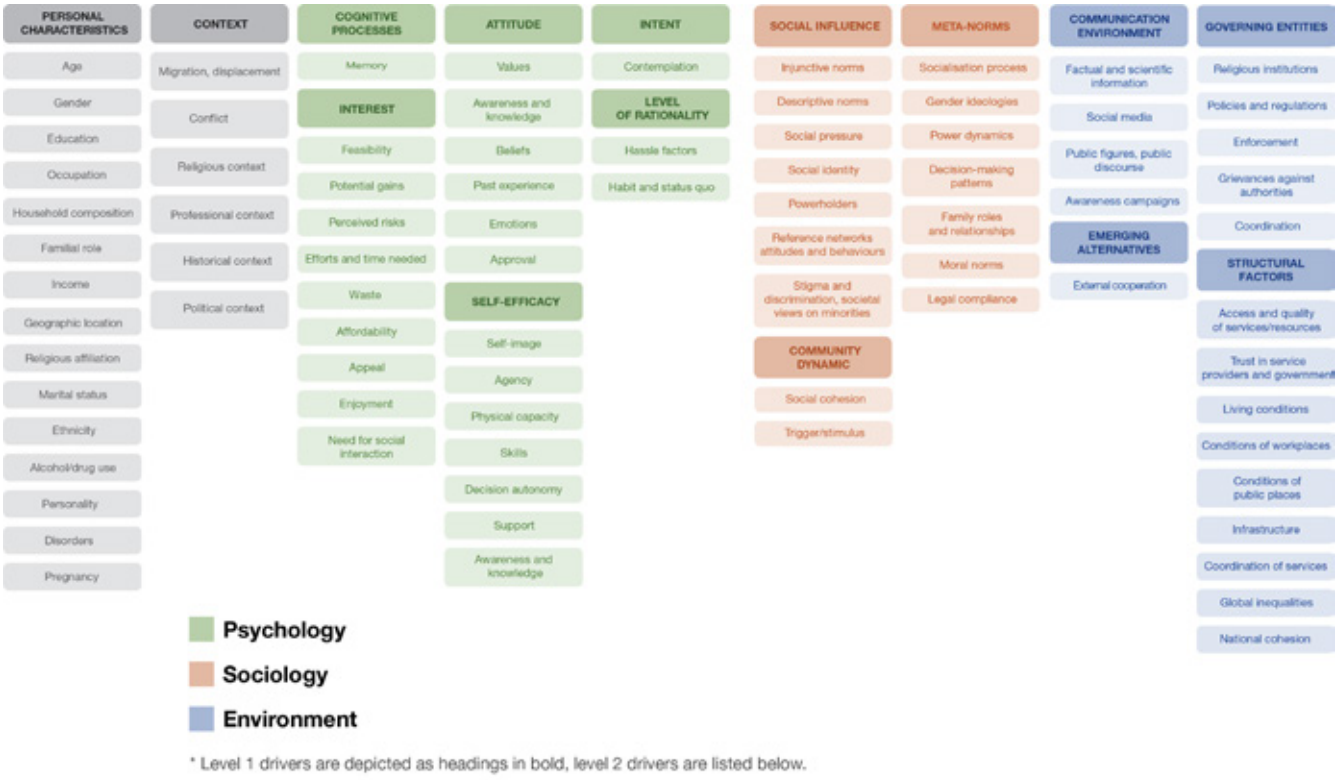
- Using celebrity actors and influencers to spread awareness (e.g., Jordan)[2]
- Forming inter-ministerial (health, information and education) committees to coordinate awareness-raising activities (e.g.,Oman)[17,2]
- Holding daily press conferences on national and local television, radio and social media (e.g., Tunisia)[15]
- Deploying a multi-faceted approach using social media, face-to-face initiatives and call centres (g.g.,Saudi Arabia)[16]
- Pushing public information by SMS, sponsored Facebook advertisements, information hotlines and using social media and television to counter misinformation circulating through those channels (e.g., Egypt).[18,19]

The reaction to state-led campaigns appears positive in several different settings (Bahrain,[20] Tunisia,[15] Morocco[14]). Whilst in others (such as Palestine and Egypt), the media have been accused of inciting panic and the lack of accurate information along with an abundance of misinformation has had adverse consequences such as increasing stigma associated with COVID-19 patients.[21,22] The Saudi efforts have been reported as particularly effective, drawing on lessons from their previous experience with MERS to launch a pre-emptive campaign, although its emphasis on online information has limitations for those with lower internet penetration such as the elderly and some migrant worker groups.[23]

Common overarching themes influencing prevention, detection and response behaviours

Human behaviours can be hindered or enabled by multiple drivers: personal characteristics or psychology of the individual; social influences, norms and pressures in society; and features of the broader environment or context of which an individual is part. Then there are a multitude of possible drivers stemming from the various layers of the ecosystem.

Table 2: Level 1 and 2 drivers emerging from the evidence - adapted from the BDM



* Level 1 drivers are depicted as headings in bold, level 2 drivers are listed below.

In order to design an effective RCCE strategy motivating a specific change in behaviour, it is necessary to identify the specific driver or drivers that have the most influence for that particular behaviour, for a specific group of people in a given context.

Personal characteristics

Personal characteristics contributing to low compliance with public health measures across populations included male gender,[19,24,25,26,27] lower education level,[19,24,25,26] older age[19,24,27] or younger age,[25,26] and rural location.[19] Many studies did not clarify why these particular characteristics were important. In the case of gender, it was evident that men's usual social and professional or labour activities led them to leave the home more often and socialise more frequently than women. This in turn had implications for distancing and quarantine. In general, the studies also found that men in the region tended to be more prone to taking risks and less likely to adopt preventive behaviours than women.[28] Knowledge level, in itself a predictor of compliance, had similar influencing factors to compliance levels. Lower knowledge was associated with male gender,[1,25,29] lower education,[27,18,24,25,23,29] lower income,[27,18,23] rural location,[18,19] and older age.[19,24,29]

Context

Displacement and migration exacerbate difficulties faced by the general population in following recommended basic protective measures such as handwashing, maintaining physical distance, and isolating at home. Public health preparedness activities have been largely successful in preventing outbreaks amongst internally displaced persons (IDPs) and refugee populations in the region. However, displaced people and migrant populations living in crowded and precarious situations experience particular challenges in maintaining distance and adhering to hygiene measures.

Religion featured as both an enabler and a barrier to various behaviours. Religion cuts across all three BDM categories, and for this reason this review sees it to be contextual. Religion is present in personal characteristics (religious affiliation), psychology (personal values and beliefs), sociology (moral norms) and environment (relating to the activities, rules and discourse of religious institutions and religious leaders).

Islam has strong teachings around infection prevention and control, which are in line with accepted public health measures, and which can be harnessed to promote positive behaviours. Religious institutions have shown great flexibility and adaptability in creatively finding ways to bring scripture in line with public health requirements, for example, by allowing the use of alcohol-based hand-rub, and making a distinction between "covering the face" (which is not permitted for women during certain religious rituals), and wearing a face-mask.

The commonly held belief that Allah is responsible for disease and will protect believers from infection was also found to influence people's attitudes and behaviours with regard to preventive measures.[30,31,32] In Morocco and Kuwait, for example, believers protested against the closure of mosques by organising marches and turning to social media to proclaim their refusal of all precautionary measures, asserting that the virus could be challenged through the power of faith.[33] Other ritual behaviours, such as kissing shrines, have been performed in defiance of COVID-19.[34]

Populations facing multiple contextual challenges may not prioritise COVID-19. Although literature was not available about the events that emerged in Lebanon during the research period, the large explosion of ammonium nitrate that devastated a large area of Beirut in August 2020 brought to light the effects that emergencies can have on compliance with public health measures. With the country already experiencing dire economic and political circumstances before the start of the pandemic, this event led to a further pressure on the health system and exacerbated the strains on an already pressured population. With 300,000

people made homeless by the blast and hospitals overcrowded with the wounded, physical distancing was simply not possible and was not the highest priority for people.[35,36] Yet, civil society volunteer groups and local NGOs rallied together to extract people from collapsed buildings, take people to hospital, set up makeshift clinics, and provide food and water to those in need. This thriving and well-organised civil society can be seen to be a product of the country's weak governance over many years, and is a testament to what can be achieved and harnessed in terms of local knowledge, social cohesion and community-led solidarity.[37] People in Iraq and Lebanon have stated that COVID-19 is an "insignificant threat" compared to that of the hunger, poverty and desperation they face in their daily lives and for which they hold the government responsible.[38,39] Anti-government demonstrators in Iraq have also mobilised to disseminate prevention information related to COVID-19 and provide masks and sanitiser to the public.[38]

Psychology

Interest, attitude and self-efficacy featured as important drivers for many risk behaviours. People's perceived risk of a practice (e.g., risk of side-effects from vaccination; losing income as a result of quarantine; getting dry skin from repeated handwashing) weighed against the potential gains (not getting sick; not being stigmatised) and contributed to their level of interest in following the practice. People's values (such as a desire to "do the right thing"), alongside their emotions (e.g., fear of getting sick; disgust at having dirty hands) were also important influencers. In terms of their self-efficacy, people's emotional wellbeing and 'decision autonomy' contributed to the likelihood and/or their ability to decide to adopt a particular action (e.g., people suffering from trauma had difficulties washing their hands; people who relied on family members to make decisions were prevented from accessing healthcare). Awareness and knowledge were underlying drivers to all of these factors. Lower knowledge levels around COVID-19 were generally associated with lower rates of compliance.[19,25,27,40,41,40] Differing understandings of disease aetiologies or lack of knowledge about infectious disease influenced behaviours around treatment and prevention for infectious diseases.[42]

Sociology

Social influence and meta norms were key drivers for some behaviours. People were driven by social norms that dictated what they are expected to do in society (injunctive norms) and that describe what people think others do (descriptive norms), as well as social pressure to practise measures, such as handwashing. Role models – both positive and negative – were strong influencers, as were stigma and discrimination. Examples in the literature included children washing their hands to avoid being stigmatised by other children; and migrants experiencing reduced access to healthcare because of stigma. Meta-norms, relating to gender, power and morals were also important drivers. For example, women in the region were more likely to stay at home than their male counterparts and were also more likely to require input from family members (particularly male family members) on decisions about their actions. This has implications for practices such as complying with quarantine or curfew, and for health-seeking. Moral norms related to religion were influential, and could act as both a barrier or an enabler to certain practices in different contexts.

Environment

Structural factors including trust in governing entities, access and quality of services and resources, living conditions and infrastructure all affected compliance. Access to resources such as soap and water for handwashing or COVID-19 test kits had implications for whether people could carry out protective behaviours. Lack of functioning or accessible health

services, particularly in conflict settings, had implications for health-seeking and case reporting behaviours. Overcrowded living or working conditions, as well as overcrowding in mass prayer gatherings, had implications for distancing and hygiene, as well as people's abilities to quarantine or self-isolate.

The level of popular trust in the governing entities emerged as a key theme influencing compliance with COVID-19 prevention measures in many countries, although this was more evident in media reports and essays than in the scientific studies included in the review, and there was conflicting evidence between some studies within the same country. Trust varied according to different groups (refugees, migrant populations, youth et al.) and political environments (e.g., fragile states, Maghreb nations or Gulf States). In the Gulf countries, there tended to be a higher level of trust in the government. Residents of Saudi Arabia were reported as being highly supportive of the government's response, and to have demonstrated high compliance levels.[27,26,16] Youth in Kuwait and Bahrain were also reported as demonstrating positive attitudes to the government response and coming together in solidarity to support public health efforts.[43] Social media influencers in the UAE encouraged people to adhere to government directives via Twitter using the #Abiding_nation hashtag.[44] Some studies, however, reported lower overall compliance in Oman,[45,46] UAE47 and Kuwait.[48]

In some countries a lack of transparency, the curtailment of free speech and the expansion of state powers in the context of COVID-19 had exacerbated historical state-public mistrust and consequently led to popular disinclination to follow government-directed prevention measures in countries such as Iran,[49] Yemen,[50] Egypt,[51] Morocco,[52,41] Iraq,[53] Djibouti,[53] Lebanon[54] and Syria.[55] It was reported that many people in Yemen did not believe COVID-19 was real but rather that it was a political fabrication, devised either by a corrupt national government, foreign governments or drug companies for economic gain.[56,56] Scholars believe that in Iran, a perceived lack of transparency and long-term erosion of trust between citizens and the state has led to low compliance with distancing measures and reporting of cases to the authorities.[57,58,59,49] However, KAP studies in Egypt[19] and Iran[24,25] conversely reported good levels of compliance, perhaps pointing to the difficulties of relying on self-reporting rather than observed behaviours. In northern Syria, a lack of public confidence in local administrative authorities is thought to have hindered the implementation of curfew[55] and studies in other areas of Syria also reported low levels of compliance with prevention measures.[40,60] In Algeria, political movements originally continued protests in the face of movement restrictions; however, anti-government actors later suspended marches in a move to support containment efforts.[61] Protests against lockdown measures also occurred in Egypt.[62]

Studies in the Maghreb[41] reported low levels of confidence with prevention measures, which affected compliance. Health workers in Morocco, Algeria and Tunisia reported feeling that the low levels of compliance could be attributed to the public's historical and contemporary mistrust of the government, and a failure of the health system to engage communities and foster a sense of "health democracy" in the population.[41] However, Tunisian and Algerian health workers themselves reported feeling positively toward their governments' risk communications campaigns and the role played by civil society in the pandemic.[63] A study of the general online population reported relatively high levels of satisfaction with the government response in Morocco, but a lack of confidence in the government's ongoing ability to respond over time.[14] In Tunisia, it was proposed that high levels of trust in the government's ability to control the pandemic and relatively high compliance may be attributed to the recent change in government, an extensive communication campaign and the relatively strong public health infrastructure.[15]

Respondents to different studies in Jordan were relatively supportive of the measures taken by the government,[30,31,64] and comparatively good levels of compliance were reported.[65] However, refugee adolescents in Jordan were reported to believe they would not receive assistance if they contracted COVID-19, and some felt the government was not doing enough to enforce the rules.[30] In Palestine, good compliance was initially reported, but then diminished and there were reports of COVID-19 being used as a mechanism by Israel to further expand power, such as the demolition of a COVID-19 drive-through testing centre in the West Bank.[66]

A communication environment in which people have access to factual and scientific information that is accurate, timely and communicated by trusted sources and though trusted media is crucial. There was evidence of the effectiveness of a number of awareness campaigns, by both governments and external partners, that encouraged people to wash their hands, stay at home and adopt other preventive measures. Conversely lack of information can constitute a significant barrier for people to understand the disease, the options they have, how to protect themselves and where to seek care etc. Incorrect information and myths proliferate in outbreaks of new diseases that are characterised by evolving evidence. This is an important problem as advances in scientific knowledge about COVID-19 constantly generates new evidence. This phenomenon has been observed globally with COVID-19, including in the MENA region. For example, the lack of coordinated leadership and communication in Yemen led to the proliferation of myths about the virus, including that doctors were instructed by Houthi rebels to administer a lethal injection to COVID-19 patients, thereby discouraging the reporting of cases and presentation for treatment.[56]

Influencers such as public figures and religious institutions, including religious leaders (particularly in the Gulf States), have frequently appeared in the media since the start of the pandemic to effectively promote specific behaviours to the population in the region. For example, religious leaders endorsed the use of alcohol-based hand-rub, encouraged people to pray at home rather than at mass gatherings, and reassured pilgrims who were not able to attend mass gatherings due to containment measures. The positive support of religious leaders cannot be assumed however, and in some settings they were reported to have encouraged risky behaviours such as visiting shrines for treatment. In addition, in the Gulf States in particular, public figures such as religious leaders continue to appear in the media, and social media influencers use their platforms to urge people to adhere to the government's directions regarding quarantine and other public health guidelines.[43,67]

Prevention behaviours – barriers and enablers

Limiting the transmission of COVID-19 requires a high level of compliance with preventative measures such as regular hand washing, good 'surface hygiene', use of face coverings, and maintaining physical distance from people. Evidence from the scientific literature in the region relating to these practices is described below.

Handwashing

Handwashing behaviour was influenced by psychological, sociological and environmental factors, as well as personal characteristics and contextual factors. In terms of self-reported practice, studies undertaken prior to the COVID-19 pandemic found low levels of hand hygiene in the region. In one study, only 40% of Iranian nurses reported frequent washing of their hands in the workplace,[68] and a multi-country study in the context of MERS-CoV reported

that only between 40% and 50% of respondents across Saudi Arabia, Kuwait, the UAE, Qatar, Bahrain and Oman washed their hands as a preventive measure.[32] Some studies carried out prior to the COVID-19 pandemic also showed low awareness and knowledge regarding handwashing (nurses in Egypt,[69] produce handlers in Qatar[70]).

Encouragingly, in the context of the COVID-19 pandemic, however, good handwashing practices in the general population were reported across multiple countries (including Qatar,[71] Egypt, including migrants,[19] Iran,[24] Iraq,[72] Jordan, including refugees,[65,31] Sudan,[29] Morocco,[14] and Algeria[73]). In a Syrian study, 91% of respondents claimed to practice better hand hygiene than before the lockdown.[74] Most studies found high levels of awareness of the importance of handwashing (Egypt,[18] Saudi Arabia,[27,75,16] Syria,[40] refugees, host communities and university students in Jordan,[65,31] internally displaced women and children in Iraq,[76,77] health workers and religious scholars in the UAE[78,79]). In other studies, handwashing was reported as being "almost unrealistic" by a Kenyan oil worker in Qatar, where six bathrooms were shared by 450 men.[80]

Personal characteristics were described as determinants of handwashing (including age, education, occupation, geographic location, familial role and household composition), but these were not consistent across studies or countries, and thus are not elaborated upon here. Some contextual factors were also seen to influence handwashing behaviour. In a study of handwashing among internally displaced children in Iraq, displacement had the effect of disrupting 'reference networks' (the network of people an individual looks to and imitates for their attitudes and behaviours), in particular children who had lost parents had sometimes also lost their role-models for handwashing. It was found that older children, however, often assumed on the role of influencer and took pride in showing younger children how to wash their hands.[77]

Religious context was also a strong influencer for hand hygiene. Barriers included a reluctance to use alcohol-based handrub due to Islam's prohibition of alcohol, and a belief that using alcohol on the hands would cause them to become 'Najis', a religious concept that implies impurity or uncleanliness. However, religious institutions exercised a tolerant and adaptive approach to the use of alcohol for health purposes,[81,82] and many health professionals as well as religious scholars have concluded that the use of alcohol-based handrub does not conflict with religious beliefs.[68,79,83] Further, handwashing is considered a fundamental tenet of Islam, as endorsed by the Prophet Mohammed,[84,79] and obligatory ritual handwashing is part of daily life for Muslims, both at home and at religious gatherings such as the Hajj.[81,78,82] Pilgrims in a sacred state of Ihram are not permitted to use scented soap, and although unscented soap may be available, most pilgrims at the Hajj reportedly wash their hands using only water.[82] The consideration of the right hand as being used to handle pure things and the left to handle impure things is another teaching of Islam that could be harnessed in a way that restricts the spread of disease.[85] The scientific literature relating to the influence of religion was dominated by references to Islam. Insight on influences from other religions was not identified in this review.

Social norms, social pressure and role models were found to influence handwashing practices both positively and negatively. Those who were aware of the expectation of others to wash their hands or had strong role models were driven to practise good hygiene in order to conform to those expectations or moral values or to impress others.[76,63,78,69,79] Influencers included parents (particularly mothers) and older siblings,[76] professional peers,[78] and public figures.[79] Internally displaced children in Iraq mentioned washing their hands to avoid being stigmatised by other

children.[76] One child explained, “If my hands smell good, people will not try to avoid me, and I will have lots of friends,” while another concluded, “We want our hands to be clean and to look nice, so other children do not laugh at us”.[77] Conversely, a lack of strong role models or social pressure to wash hands led to poorer handwashing practices in some contexts, as was the case for displaced children, and interestingly, nurses.[76,69] Health workers in one study mentioned a fear of offending patients if they washed hands in their presence (Iran).[86]

Other barriers to handwashing included an aversion to secondary effects such as dry skin, allergy, pain caused to wounds on the hand, and a dislike of the smell of alcohol on the hands.[81,69,86,68,76] Emotional wellbeing was also an influencer, and those suffering from trauma or depression found it more difficult to maintain good hand hygiene.[76,87]

Structural barriers included unavailability of clean water, soap, alcohol and sinks at health facilities (Egypt,[69] UAE,[79]) in camp settings (Jordan,[30] Iraq,[76,77]) at mass prayer gatherings (Saudi Arabia[82]) and in communities (Syria,[40] Jordan[30]). Internally displaced children in a camp in Iraq were demotivated to wash their hands due to the distance to shared handwashing facilities that were dirty and lacked adequate lighting.[77] Conversely, it was found that some crowded or dirty conditions could motivate handwashing behaviour due to a sense of disgust and a heightened feeling of social monitoring by neighbours.[77,69] There are numerous examples of communities coming together to try to overcome such structural barriers. In Iraq, for example, anti-government demonstrators were reported to be dispensing hand sanitiser from make-shift clinics erected to treat demonstrators hit by live fire and tear-gas cannisters.[38]

Additional motivating factors for washing hands included fear of contagion (Algeria,[88] migrants in Egypt[19]), disgust at the dirt (nurses in Egypt,[69] internally displaced women and children in Iraq[76,77]) a positive feeling of cleanliness and calmness (nurses in Egypt[69,76]) and a desire to feel more attractive (displaced women in Iraq[76]). There was also some evidence of the effectiveness of awareness campaigns in increasing positive handwashing behaviour.[77,83]

Surface hygiene

There was scant literature that focused on the decontamination of surfaces or practices around touching and sharing potentially contaminated objects. A study in Egypt (including migrants) reported widespread use of alcohol and chlorine for disinfecting surfaces.[19] Studies from Qatar[70] (produce handlers) and Iran[24] prior to the COVID-19 pandemic reported poor practices with regard to the decontamination of surfaces. Refugee populations and host communities in Jordan[65] and residents of Saudi Arabia (pre-COVID-19)[84] reported avoiding the sharing of objects such as utensils and towels, although refugee adolescents in tented communities in Jordan reported sharing meals from a common pot whilst engaged in agricultural work.[30] Other studies identified a high level of awareness of the importance of regularly cleaning and disinfecting exposed surfaces and an understanding of the potential for disease to spread through touching infected surfaces across studies in Iraq,[72] Jordan[89] and Saudi Arabia.[27,26]

Religious and cultural practices influenced some risky behaviours related to surface hygiene, for example Shi’ites engaging in the ritual kissing, licking and touching of shrines at Qom in Iran. It was reported that some devotees believe this practice would cure COVID-19, and such behaviour includes an element of defiance against authorities who have forbidden the practice and threatened to close shrines.[34,90] The practice was met with a strong backlash on social media by Iranians and others who considered the practice to be irresponsible and dangerous, as well as disrespectful to the holy places, highlighting the variety of views and

understandings that can influence behaviour within the religious context.[91]
Sharing hoses during waterpipe smoking was also raised as a potential conduit for the virus. This is a popular social activity in the region, and most cafés that offer this service do not clean water pipes between smoking sessions because it is labour-intensive and time-consuming.[92,93] Some smokers are reported to have started bringing their own waterpipes or purchasing single-use hoses, although elderly men (potentially those more at risk) were more likely to use and share reusable hoses.[93] There was also anecdotal evidence that in light of the COVID-19 pandemic people were taking more precautions and choosing to use their own waterpipes. It was reported in one study that tribes in southern Iraq have banned the sharing of coffee cups.[91]

Summary RCCE and research considerations:
Emphasise the importance of surface hygiene using cultural appropriate communication channels. Invest in identifying contextual high risk cultural activities (waterpipe smoking) and ritual practices. Target audiences considering gender dynamics and engage trusted influencers and local networks in developing feasible actions.

Use of masks and face coverings

Although several studies assessed the uptake in face coverings in the general population since the introduction of COVID-19 protective measures across the region, there was little literature on this topic prior to COVID-19. Since COVID-19, a high awareness of the importance of mask wearing to prevent infection was found across countries (Iran,[25,24] Egypt,[18] Jordan,[31,94] Saudi Arabia,[27,16] Morocco, UAE and Lebanon[9]4). Whether this awareness translated into practice was not made clear in most of the literature, except in the Iranian studies, which found that more than 60% of people wore a mask in public places.[24,25] Conversely, while 75% of participants in an Egyptian study believed mask wearing would protect them from infection, only 35% stated they would be willing to wear one.[18] In a Saudi Arabian study, there was confusion as to whether mask-wearing by the general public was recommended, due to conflicting messages from global health authorities about mask-wearing in the early days of the pandemic.[27]

High use of face masks (above 60%) was reported in studies from Iran,[24,25] Egypt,19 and Algeria.[73] The majority of studies, however, reported lower use: between 20% and 60% in Saudi Arabia,[26,84,75] and Syria,[74,40]; 12% in Morocco 14; and, in the context of MERS-CoV, 24% in Saudi Arabia, Kuwait, the UAE, Qatar, Bahrain and Oman.[32] Media reports painted a picture of low mask use and defiance of requirements to wear a mask in several countries (Iran,[95] Bahrain[96]), including in crowded markets (Djibouti[53] and Syria[97,98]). In Kuwait, the government decided not to lift a partial curfew due to the failure of citizens to wear masks and adhere to other distancing measures.[48]

Older people were reportedly less likely to wear a face mask than younger people (Iran,[25] Saudi Arabia, Kuwait, the UAE, Qatar, Bahrain and Oman[32]). In the same studies, males were also found to be less likely than females to wear a mask in a public place (Iran,[25] Saudi Arabia, Kuwait, the UAE, Qatar, Bahrain and Oman[32]). During the Hajj pilgrimage to Mecca, women were more likely to wear a face covering (not a 'mask' per se) in public for religious reasons, but did not cover their faces when in their tents with other women, leaving them exposed to infection. Since men wore masks for hygienic, rather than religious reasons, it was

reported more likely that they did so both inside and out of their tents.[75] It was also reported that many women believed they should not cover their face while in Ihram, the sacred state necessary for performing rites such as at the Hajj.99 In response to this, in 2009 the Grand Mufti of Saudi Arabia pronounced a distinction between "covering the face" and wearing a mask, demonstrating tolerance to the use of masks for health reasons during the rites of the Hajj.[99] As an exemplary and respected religious leader and communicator, the Mufti was able to redefine religious norms in a way that was sensitive to the conflict between collective beliefs and disease prevention behaviours.[99]

Media reports highlighted additional reasons for choosing not to wear a mask. In Iran, these included the discomfort of not being able to breathe properly when wearing a mask; limited enforcement of mask-wearing; and perceptions of risk, "Why should I wear one even though I haven't seen anyone get the disease?"[100] The literature review did not find access or affordability of masks to be a barrier, but it was reported that masks had more than doubled in price in Iraq, and that there, anti-government demonstrators were taking it upon themselves to hand out free masks to the public.[38,101]

Summary RCCE and research considerations:
Identify level of perceived risk among different populations and the underlying causes behind why specific groups do or do not adopt the measure. Pro-actively seek and involve local-level role models among different population groups who are able to translate the use of masks in locally appropriate languages and engage with different communities in informal settings. Invest in pre-testing of messages and information / communication formats and channels involving different target groups especially those reporting low level of compliance. Develop accurate and fact-based information content and mechanisms to engage people in individual and collective decision-making around the use of masks based on contextualised research. Continue to reinforce the importance of mask use over time.

Cough etiquette

The few studies that asked participants about cough and sneeze etiquette in relation to respiratory infections found relatively good self-reported adherence to covering the mouth and nose when coughing (Egypt,[19] Iran,[24] Jordan, including refugees,[65,31] and Saudi Arabia[84,27]). All of these studies were carried out in the context of the COVID-19 pandemic, except for one in Saudi Arabia[84] that dealt with respiratory infections in general. No information was identified about behavioural influencers with regard to cough or sneeze etiquette.

Summary RCCE and research considerations:
Understand priority risk behaviours at the local level and identify local behavioural influencers prior to developing RCCE strategies.

Contact greetings

Greetings are of great importance across the region, serving the purpose of establishing social bonding, allocating status, displaying courtesy and maintaining social cohesion. The principle of greeting and response is endorsed in the Quran, and as such Muslims are expected to greet each other appropriately.[102,71] Depending on the situation and the status of those present, greetings may involve handshaking, kissing or backslapping. Misunderstandings can occur where the appropriate greeting is not forthcoming.[102] During the COVID-19 pandemic some studies recorded that a high number of participants continued to shake hands, kiss and hug (Iran,[24] Sudan[29]). This was not universal however, with studies in Jordan reporting high avoidance of contact greetings.[65,31] However, a newspaper reported that the Jordanian Minister of Health's appeal to citizens to stop kissing caused controversy on social media and the Jordanian House of Representatives called upon citizens to shake hands rather than to kiss.[91] Tribes in southern Iraq similarly decided to limit greetings to handshaking rather than kissing.[91] In Sudan, women were found to more readily avoid handshaking than men,[29] which is not surprising given that handshaking is more commonly practiced by men than women in general.

Summary RCCE considerations:
Emphasise the risk of shaking hands and of replacing one risky behaviour with another marginally less risky behaviour. Assess higher risk groups (e.g., men) in each setting. Understand those cultural practices that act as barriers, considering gender dynamics. Identify formal and informal social influencers to jointly develop strategies to adapt and promote cultural practices which are locally acceptable.

Limiting gatherings

Religious gatherings are an important part of life in the region and there is a substantial literature on 'mass gatherings medicine'. The region is home to some of the largest mass gatherings in the world. More than 3 million pilgrims from around the world gather in Mecca, Saudi Arabia, each year for the Hajj and twenty million Shi'ites visit Qom in Iran each year.[82] It has been argued that pilgrimage to Qom and other religious sites facilitated the spread of COVID-19 in the Middle East.[34] All adult Muslims who are physically and financially able to do so are obliged to carry out the Hajj pilgrimage once in their life, and in order to perform the rites they gather in close confinement with many other pilgrims and often reside in crowded conditions for the duration of their stay.[75] Many studies have documented the spread of infectious diseases at the Hajj due to overcrowding.[82,99,75] Men are much more mobile during the Hajj than women, who tend to stay in their tents. This presents different risk factors for both sexes, as men are more exposed to crowded conditions with large numbers of people, while women are confined in close quarters with other women for longer periods.[75] It is interesting to note that pilgrims who stay longer than eight days at Hajj sites have been found to have a lower risk of contracting an infectious disease than those who stayed for shorter periods. This is thought to be due to the fact that those who stay longer are able to avoid the most crowded periods for performing rituals.[75]

Despite the importance of religious events, a high level of acceptance of the need to suspend mass prayer gatherings in the context of the COVID-19 pandemic has been reported (Saudi Arabia,[26,27] Sudan[29]). In Egypt, a leading Islamic Sunni institution allowed the suspension

of mass prayers, including Friday prayers, and permitted the daily mass to be divided into several smaller services in order to limit the number of people gathering at any one time. Those with flu-like symptoms were urged not to attend.[103] In an unprecedented move, Saudi Arabia chose to allow only 1,000 pilgrims from within the country to perform the Hajj in 2020.[104] Religious leaders have reminded disappointed pilgrims around the world that Muslims are rewarded even for the religious intention of performing Hajj, and that everything is determined by the will of God.[105] However, frustration and resentment has been expressed at the cancellation of collective religious practices, particularly during Ramadan.[106]

The need for social interaction can be a strong barrier to complying with distancing measures, and social gatherings among friends or family are an important part of life across the region.[40,26,75] In Iran, Libya and Sudan, it was reported that many people still gathered for weddings and mourning ceremonies as well as for public ceremonies marking Eid al-Fitr despite being urged to not do so.[57,107,108] In Oman people were allegedly meeting secretly in their homes to celebrate weddings or birthdays in defiance of government directives.[45] Inviting people to your home can be linked to social status and prestige and is often seen as a moral duty (Egypt). Abandoning house visits could signify a loss of status, influence and even community leadership.[106] Despite this, during the COVID-19 pandemic, high numbers of study respondents in Saudi Arabia[26] and Qatar[109] stated that they have avoided public gatherings. Seventy per cent of Qatari respondents in another study said they did not allow relatives and friends to visit them.[71] A general compliance with the ban on gatherings in Jordan is thought to be attributable to significant penalties for not complying.[30] In Iraq, tribal sheikhs announced that "The continuation of tribal or even popular traditions and customs related to visits, collective celebrations and paying condolences has caused great harm to society", and that as clan elders, they had decided to reduce public gatherings of any kind.[91]

Gender has once again been found to be an influencer, with men and boys more likely to leave the house in order to socialise than women or girls (Jordan[30]) and also more likely to take part in family, social gatherings or networking events in the home (Kuwait).[110] As a 16-year-old girl from Amman described in one study, "When the government says it's lockdown time, people go out and gather, especially young males. I see them from my home roof, they gather on roof terraces or they gather and go out to play in the streets."[30] A boy from the same study said, "Restrictions were imposed to protect everyone, but we are not accustomed to staying at home. Personally, I cannot get used to being at home all the time, I feel I am in prison."[30] In Syria, 3,000 soccer fans attended the final of the Syrian Premier League.[98]

Political protests, another form of gathering, are not uncommon across the region and have occurred in numerous countries despite COVID-19 containment measures, including in Lebanon[54], Iraq[38], Sudan[111] and Morocco[52]. In some cases, rallies have been held to protest the restrictions, in Egypt[62]. In Algeria, the Hirak political movement initially saw COVID-19 as a political manoeuvre to contain the protests and claimed, "Neither the coronavirus nor cholera will stop us." However, Hirak leaders later began to take the virus seriously and urged their followers to abandon protests.[61] Following the advice of health professionals was also an act to protect the legitimacy of the movement.[112] In Lebanon, anti-government protestors asked, "Are we going to die of hunger or die of coronavirus?" and "'They can try to scare us as much as they want, tell us stay at home, you›ll be contaminated, but the Lebanese people won›t let it pass any more."[54] These comments illustrate the ways in which underlying structural issues such as grievances against authorities and food insecurity have influenced people's actions and can become a barrier to compliance with public health measures.

Summary RCCE considerations:
Incorporate context and gender specific learnings from 'mass gatherings medicine'; harness the existing positive cultural and religious behaviours; adapt RCCE to underlying political barriers to trust.

Staying at home

With regard to limiting visits outside the home, in a number of studies the majority of respondents reported trying to stay at home except to purchase essential items or during emergencies (Egypt, including migrants,[19] Iran,[24] Qatar,[71] Morocco[14]) although this finding was not evident in studies in Syria[40,60] and Iran[25.24] Gender was again found to be an influencing factor, with men and boys more likely to need to spend time outside of the house (Jordan,[30] Iran,[25] Yemen,[113] Saudi Arabia[71]). Participants in Jordan[30] and Syria[60] asserted that staying at home was difficult, but respondents in Jordan[30] and Saudi Arabia[26,27] acknowledged staying at home to be an important prevention measure against COVID-19. Awareness campaigns in Saudi Arabia seem to have positively impacted people's commitment to staying home.[23,16] When people have gone out, there was a widespread tendency to try to avoid crowded places (Egypt,[19,51] Jordan,[65] Syria,[74] Sudan[29]).

In countries including the UAE,[114] Palestine,[22] and Lebanon,[115] social media users have adopted the #StayAtHome hashtag to encourage people not to leave their homes. In the UAE, the hashtag became widely popular, gaining more than 870,000 likes, shares and comments. Well-known brands and celebrities also used the hashtag to join the conversation, encouraging people to respect the directive to stay home.[114]
Bollywood star Shah Rukh Khan used the #StayHome hashtag to appeal to the Indian migrant community in Dubai, writing "Stay in your homes, stay healthy and protect Dubai."[44] Islamic scholars, within and also outside the region, have used the Internet to share a prophetic narration to encourage people to stay at home unless for urgent need. The hadith states, "If a person, in the time of an epidemic plague, stays in their home patiently waiting for Allah s.w.t's reward and believing that nothing will afflict them except what Allah s.w.t has written for them, they will get the reward of a martyr."[116,117]

Summary RCCE and research considerations:
Identify reasons for willingness and barriers to follow to stay-at-home guidance in different contexts and different groups (both structural and individual reasons). Build on best practices and involve local level role models to promote staying at home among their families, friends and neighbours. Use epidemiological data to identify who is most at risk (of getting infected or infecting others) and identify priority groups for increased outreach and engagement – including digital engagement as well as the mapping of locally common gathering places.
Strengthen two-way communication with priority groups and jointly design and introduce solutions to decrease the risk identified (wearing face masks, keep distance etc.).

Individual spacing

Low-wage migrant workers in the Gulf states have specific challenges with regard to following prevention measures, since they tend to live, work, commute and dine in crowded conditions.[118,118,80] Migrant populations in Egypt,[19] refugees and host communities in Jordan,[65] and a sample of the general population in Qatar[71] reported maintaining a distance of 1-2m from others. Less than half of respondents in a study in Iran did so.[24] Respondents in Syria mentioned that there was insufficient space for physical distancing,[40] while LGBTQ populations in Lebanon reported distancing challenging since they were often excluded from the workforce due to discrimination and had a peripatetic lifestyle, having to move from house to house, sleeping on friends' couches.[119] A survey in six Middle Eastern countries during the MERS-CoV outbreak found that around 75% of respondents avoided close contact with people who had fever or cough, and that those who did so were likely to have higher education. Respondents from Oman, Saudi Arabia and Qatar were more likely to avoid close contact with sick individuals than those from Bahrain, UAE and Kuwait.[32] In Libya, Sudan and other conflict-affected areas, displacement and the resultant crowded living conditions also made physical distancing a challenge.[120,108] Likewise, in the poor neighbourhoods of Khartoum in Sudan, people living in small, crowded houses and street vendors reported that they were unable to maintain physical distance.[111]

Photos posted on the Internet showed crowded scenes on public transport in Egypt,[121] and highlighted that the authorities did not set a good example, with the health minister holding a news conference in a room packed with more than 50 journalists in close proximity to one another.[122,121] The Prime Minister of Sudan and ministers have also been accused of failing to practice physical distancing.[123] In August, in Iran, there were reports of densely packed public transport systems, banks, offices and streets, as people ignored physical distancing rules. A Health Ministry poll in June found that only 40% of people were following distancing rules.[58] In Algeria, people outside the capital were found to not be following distancing guidelines after the lifting of lockdown measures, which commentators attributed to a "Lack of civic responsibility in the population."[124] Other reports stated that people had no choice but to congregate in stores to secure flour and couscous, since food and other necessities were in such short supply. Fights were reported to break out in many stores across the country, again illustrating how the population's basic needs took priority over precautionary measures.[122] There were similar reports from Sudan, where people needed to queue for fuel and food due to shortages.[111] People also reported mingling in crowded markets and shops in Djibouti,[53] Lebanon,[39] and Syria[97] and not adhering to distancing measures in public spaces and workplaces in Kuwait.[48] More encouragingly, people were reported to be maintaining physical distance during Friday prayers in mosques in Jordan.[125]

In a number of cases, a lifting of lockdown and an easing of restrictions appeared to encourage people to relax personal prevention measures such as individual spacing, which is paradoxical given the fact that physical distancing is perhaps even more important following the easing of lockdown measures.[126,124,127] Such behaviour indicates a need to reinforce and strengthen risk communication about continuing to practice safe behaviour even as restrictions ease, and to use a structured approach to engage with identified primary and secondary target groups.

Summary RCCE and research considerations:
Adapt RCCE in certain high-risk groups, such as migrants, who face structural barriers and for those who perceive themselves to be low risk. Coordinate with other sectors / pillars and share behavioural and social data to develop support mechanisms and/or adapt programming (e.g. food distribution). Emphasise leading-by-example and civic responsibility. Frequently reinforce efforts when guidance changes. Engage concerned groups in decision-making processes (identification of priority groups for assistance, mechanisms to access assistance, organising and making the workspace safe, manage the client flow etc).

Immunisation

Little data was available about people's perceptions around a potential COVID-19 vaccine. Lessons can be learnt, however, from earlier studies relating to immunisation. Data on influenza vaccine uptake shows generally low rates of uptake across the region, including among health professionals[128,129,84,130] The highest rates were among health professionals in Qatar following a vaccination campaign.[131] Studies on childhood vaccination in Iraq and Sudan showed that around half the children had received vaccinations.[132,133] In Saudi Arabia, a news report stated that 80% of parents refuse to give approval for their children to be immunised against influenza.[134]

Barriers to vaccine uptake existed across all domains. Contextually, conflict in Syria and the resulting partial collapse of the healthcare system led to disruptions in the vaccination schedule and a decrease in coverage rates.[135] Conflict in Yemen drove people to prioritise food assistance and treatment of acute conditions over preventive medicine such as vaccines.[136] In Morocco, historical and political factors resulted in a vaccine against influenza A(H1N1) being perceived by some people as a tool by the USA to harm Muslims, or to be linked to financial and political interests.[137] In Yemen, beliefs about foreign entities advocating for vaccination and family planning led to vaccine hesitancy.[136] In some settings, the availability of vaccines was found to be a barrier to uptake.[130,135] Affordability of vaccines (Iran),[128] perceived risk of side effects (Saudi Arabia,[129,84] Morocco,[137] Qatar[131]) and an assumption of not being at risk of disease (Saudi Arabia,[129] Qatar[131]) were all reported as barriers to vaccine uptake.

Other barriers included beliefs that a vaccine would not work (Saudi Arabia[129,84]), an inability to allocate time to take the vaccine (Saudi Arabia,[129] Kuwait[130]), a fear of injections (Qatar,[131] Morocco[137]) and a lack of awareness and knowledge about vaccines (Morocco,[137] Libya[138]), including among medical students and health workers (Saudi Arabia,[129] Kuwait, Oman, UAE[130]). In addition, personal characteristics such as lower income (Egypt,[130] Iran[128]) and geographic location (Iran,[128] Saudi Arabia[129]) were reported to be barriers. A news report from the UAE in 2019 discussed a public outcry against a decision by the Ministry of Health and Prevention to make a cervical cancer vaccine mandatory for all female students from eighth grade onwards. The concerns were around potential negative effects of the vaccine, as well as the fact that a cervical cancer vaccine was not needed in a pious Muslim society. The authorities eventually clarified that the vaccine would require prior approval of the girls' parents.[134]

Factors thought to have contributed to vaccine uptake in an intervention-based study with health workers in Qatar included the use of peer vaccinators to help stimulate interest in vaccination; provision of the vaccine free of charge; an extended vaccination campaign including a communication campaign using face-to-face contact, email, text messages, brochures, flyers and social media; and concerted efforts to address misconceptions about vaccination.[131] In Jordan, a childhood polio immunisation awareness campaign targeted imams, having identified this group as key in delivering information about the importance of immunisation. As trusted figures, they had the capacity to dispel misinformation about the harmful effects of vaccination and encourage parents to see vaccination of their children as a responsibility.[140]

Summary RCCE and research considerations:
Assess and address the non-structural causes of vaccine hesitancy and low uptake. Engage early with different groups – in advance of a vaccine being available – and identify those who could play a critical role in promoting vaccine uptake. Assess approaches to/feasibility of RCCE addressing low uptake in fragile and conflict settings where health system capacity is poor. Share research findings and regular behavioural and social data across pillars of the response and work closely with policy-makers to ensure equal and inclusive access to a vaccine (RCCE platform and actors can play a role in this).

With regard to perceptions about the future SARS-CoV-2 vaccine to protect against COVID-19 a number of studies had recently been published. In Egypt, 73% of participants stated that they were looking forward to receiving the COVID-19 vaccine,[18] although the figures for those who intended to take a vaccine as soon as it became available were lower in UAE (46%), Saudi Arabia (41%), Jordan (37%), Lebanon (31%), and Morocco (21%).94 Syrian refugees in Jordan reported their children not being accepted for vaccination since they were not able to register for a UNHCR ID due to the office being closed for the COVID-19 lockdown.[30]

Detection behaviours – barriers and enablers

Testing, case reporting and contact tracing

Large disparities were found to exist across the region in terms of testing and contact tracing capacity. In countries including Qatar, Kuwait and the UAE, active testing and the use of electronic applications for tracing enabled the reporting of high case numbers.[141] Testing was also reported to be more frequent in Djibouti.[142] Contact tracing apps in Bahrain, Qatar and Kuwait were criticised by human rights groups as raising privacy and security concerns.[143] In Qatar, the app was mandatory, with a maximum fine of USD 55,000 for not having it installed prior to leaving home.[144] A voluntary contact tracing app was also introduced in Morocco.[145] Meanwhile, countries experiencing conflict including Yemen, Syria, Iraq, Libya and Palestine continued to have limited testing capacity and a lack of test kits.[146,147,141,148,149,150,56] Other countries including Iran and Egypt have been accused of intentionally under-testing in order to keep official case numbers low.[151,152,153,58,59] In Yemen, it was reported that test results were not always released, and family members were not informed as to the cause of death of family members.[50] In Lebanon, competition between sectarian political parties led to some party members patrolling sectarian enclaves and offering free testing services.[154]

The review found very little data on people's behaviours or attitudes toward testing, case reporting or contact tracing relating to COVID-19 or other infectious diseases. Two studies touched on the issue of testing for COVID-19, both from Egypt; one study from Sudan mentioned perceptions of testing for a different disease; and one study from Iraq and one from Jordan mentioned case reporting. No studies dealt with contact tracing. Because of this limited data, the review consulted perception data and media coverage on these topics if available.

The majority of participants in both of the Egyptian studies stated that they would be willing to report for testing for COVID-19 if they experienced relevant symptoms.[1,18] A rapid assessment of Egyptians and migrants predominantly from Sudan, Syria and Yemen, reported a number of personal characteristics as influencing people's willingness to be tested. These included age, gender, education level, marital status and geographic location. Older participants who completed the survey online were more likely to be tested, and in the case of migrants, the 30-49 year-old cohort was the least likely of all age groups. Those with a higher education level, those who had never been married, and those from rural areas were more likely to be tested. Responses also differed according to governorate: Damietta had the lowest rate, with only 42% of respondents asserting that they would be willing to take the test. Female migrants were slightly more likely than male migrants to be tested.[19]

Perception data gathered from humanitarian actors by ACAPS found that refugees were considered to be at greatest risk of not having access to testing, particularly in Yemen and Syria, due to restrictions on transportation. It was also suggested that stigma towards infected people could dissuade individuals from accessing testing.[155] Those thought least likely to access tests were refugees, migrants, people without transportation, IDPs, rural residents and people unable to pay.[155] Fear of quarantine and stigma was thought to be a demotivator for accessing testing among IDP populations in Iraq.[56] Thousands of Palestinians who returned from working in Israel in April were not able to be tested at the border, and some intentionally avoid the checkpoints.[156]

In the context of a different disease, Visceral Leishmaniasis, community members in Southern Gadarif, Sudan reported perceiving a positive diagnosis of the disease as a blessing or good luck as it may mean a cure was within reach. It may be worth investigating if this perception is more generalised across the region and could have implications for people's willingness to access testing for COVID-19.[157]

In terms of case reporting, the majority of online survey respondents in a study in Iraq stated that they had cooperated with health authorities by reporting potential COVID-19 cases.[72] Psychological drivers that presented as barriers to case reporting included the perceived risk of losing income (Egypt[18]) and a lack of acceptable environment if required to isolate, as well as a fear of the unknown (Iraq).[72] In terms of social influence, the authors of one Egyptian study concluded that stigma associated with COVID-19 may lead to under-reporting, with 23% of respondents stating that COVID-19 infection was a cause for stigma.[18] Another report in Egypt found that COVID-19 patients and their families, as well as the health workers who had been in contact with them, had been bullied, leading many patients to avoid reporting their infection.[21] Conversely, 95% of university students surveyed in Jordan felt that COVID-19 infection was not a cause of stigma, and that accordingly they would not hide it from health authorities.[31] Around 10% of both men and women in the Iraq study responded that social norms would prevent them from reporting, although no further detail was provided.[72]

Media reports from Iran speculated that fear of stigma and a lack of trust in the government led to uncertainty about the potential repercussions of reporting illness, and these concerns may also be deterrents to testing and case reporting.[59,152] In Yemen, the media highlighted that people were afraid to report COVID-19 cases due to fear of retaliation from officials from the Houthi political movement.[50]

Unrelated to COVID-19, a study of caretakers in Egyptian villages noted that it was difficult to exercise surveillance for mild cases of respiratory illness, as people used a variety of healthcare providers to report their illness. Yet, people with severe symptoms tended to visit large hospitals, making it easier to build a surveillance system for these cases.[42] Issues of severity of illness are also likely to impact people's reporting and presentation of COVID-19.

Summary RCCE and research considerations:
Assess local behaviours and attitudes toward testing, reporting and contact tracing in different population groups. Prioritise higher risk groups and settings. Respond to barriers including fear of stigma, fear of repercussions (e.g., loss of earnings after a positive result) and political distrust. Collaborate with others to advocate for and ensure safe mechanisms for contact tracing (e.g., data protection mechanisms for digital tracing; health worker training on psychosocial support and socio-cultural communication). Seek to minimise the risk that community engagement about testing and tracing can be undermined by limited health system capacity.

Health-seeking and antenatal and postnatal care-seeking

A number of factors influence people's health-seeking behaviours across the region and are likely to be applicable to their access to antenatal and postnatal and healthcare services during COVID-19. The high cost of healthcare or incidental expenses was cited as a major barrier to accessing both maternal and regular health services in Egypt,[158] Iraq,[132] Yemen,[136] Sudan,[157] Jordan and Lebanon (including Syrian refugees)[159,160,161,161] and Iran (Afghan migrants)[162]. Those with lower incomes were often reported as being less likely to access reproductive and maternal health services,[139,162,163,164] as were those with less education.[139,162,159,165,166,164]

In Sudan,[157] and Morocco[167] lack of available or affordable health services led to the use of traditional medicine. A lack of decision-making autonomy and a sense of the need to place the family's needs above their own health led to reduced healthcare access by women in UAE[168] and female Afghan migrants in Iran[169], and to less use of ANC by Syrian refugees in Jordan and Lebanon.[161] Some Egyptian women reported to be reluctant to access maternal hospital care because of the male gender of obstetricians.[158] Studies found that women who felt that they were respected and well-informed during their care were more likely to return for subsequent maternal health appointments.[159,162,163] Stigma led to restricted access to health services for LGBTQ populations in Lebanon[119] and Afghan migrants in Iran.[162]

Conflict and displacement situations can also influence care-seeking in different ways and need to be considered according to the specifics of the different circumstances these take in the region. As well as impacting on the availability and quality of health services

and resources,[132,136,170] physical access could be restricted during conflict due to insecurity, roadblocks and lack of transportation[136,132,161] and individuals reported avoiding seeking care due to fear of leaving their homes.[132] Women in conflict situations reported reduced access and availability of maternity care (Iraq,[132] Lebanon,[170] Yemen,[136] Syria[135]). Over the past twenty years, there has been increasing recognition that the basic needs package for displaced persons should include a component of reproductive health services as well as food, shelter, clean water, sanitation and basic health care.[170]

Religion and other beliefs can also play a role in health-seeking behaviours. Believers who considered that Allah would heal them may choose not to access health services during times of ill-health.[171] Others may opt for ritual or traditional healing practices in light of their beliefs about the origins of disease.[157,168,167] Miscarriage is also attributed to God's will or supernatural forces in many areas across the region, and some women in Qatar choose to hide their pregnancy, recite verses of the Qu'ran (ruqyah) or seek treatment from a religious healer as a way of protecting their baby from the Evil Eye.[172]

A number of studies asked respondents what they did or would do in the event that they or someone they knew experienced COVID-19-like symptoms. In Egypt, most respondents confirmed that they were likely to call the COVID-19 hotline first, while the next largest group would visit the hospital or health unit, followed by isolation and testing. Those who were interviewed in the community were more likely than those who completed an online questionnaire to report a preference for attending a health. Migrants reported that they would also call the hotline first, but would self-isolate before visiting the hospital or health centre. A smaller percentage of migrants suggested they would seek advice from relatives or purchase medication from the pharmacy.[19] A separate study in Egypt reported that many people were self-medicating as a result of misinformation circulating on Facebook about drugs claiming to cure COVID-19, such as hydroxychloroquine.[18] In one large study from Iran, the large majority of participants reported that they would visit a health facility as a first action if they began to display symptoms of COVID-19, followed by a smaller number who would stay at home for self-treatment.[24]

Among displaced people in Iraq, the majority of study participants would visit a health professional as a first action, and a smaller number would telephone a health provider. Interestingly, this is contrary to domestic public health advice, which encouraged people to self-isolate and call the government hotline before visiting a health facility.[173] In Syria, the majority would visit a health provider, followed by self-isolation.[40] In Yemen, a rapid assessment conducted in April 2020 also found that respondents were more likely to attend a health facility than to self-isolate.[174] This response changed significantly in a second rapid assessment conducted in July, by which time respondents were more likely to self-isolate than visit a health facility. Other responses included seeking advice from a relative and buying medicines from the market, whilst a small minority suggested they would visit a neighbourhood nurse or a traditional healer. A number of respondents also concluded that they would wait for God's will. It was not clear from the available evidence what prompted such changes in people's intended actions. However, for those people who had actually experienced COVID-19 symptoms, 78% responded that they had visited a health facility.[175]

Barriers to accessing healthcare for those experiencing COVID-19 symptoms included a lack of awareness of the signs and symptoms that should trigger care-seeking (Iran),[24] a fear of being stigmatised after seeking care (Jordan),[31] and cost of treatment (Iraq[173] and Yemen[175]). In Yemen, respondents also mentioned a fear of becoming infected with COVID-19 in

hospital; a fear of lethal injection as a result of rumours that doctors killed COVID-19 patients in hospitals; a lack of adequate care in hospitals; the perception that it was not possible to treat COVID-19; the perception that hospitals were full or too far away; and a lack of trust in health services to deal with the epidemic.[175]

Religious influences also determined care-seeking behaviours in the context of COVID-19, with prominent religious leaders encouraging people to visit shrines and perform religious rites as a treatment for the disease.[34] The notion that COVID-19 is a punishment and can be cured by prayer was reported in some countries, whilst conversely some people believed that the treatment for COVID-19 can cause harm.[56] One blogger appealed to readers to take note that the Prophet Muhammad encouraged people to seek medical assistance in conjunction with prayer, citing that Allah created diseases but also their cures. As such, Islam could be seen to propose "an infection control mechanism that calls for both faith and practical measures to be taken in order to effectively contain infectious diseases."[85]

The capacity of health services, particularly in conflict-affected areas including Syria, Libya, Yemen, Iraq and Palestine, was already overstretched for dealing with an influx of COVID-19 patients, and humanitarian actors reported that as a knock-on effect other essential health services, including sexual and reproductive health and maternal health, have been disrupted.[176,155,150] The media reported that due to humanitarian funding cuts in Yemen since the COVID-19 pandemic, programmes for pregnant and lactating women ceased in 140 healthcare facilities, and 51 primary healthcare clinics were closed.[177] The numbers of children accessing healthcare were also reported to have dropped by 80% in Yemen between January and April 2020, due to the redirection of resources toward COVID-19, as well as an inability of families to afford travel costs and a fear of contracting the virus at health facilities.[178]

Refugees were thought to be at the greatest risk of not accessing treatment when they fell ill, due to restrictions on transportation, particularly in Yemen and Syria.[155] In a study involving adolescent refugees and host community members in Jordan, pregnant girls suggested that they were unable to access government hospitals due to the lockdown. They explained this was due to an inability to travel, due to hospitals only receiving emergency cases, or private clinics being closed. They also described fears of becoming infected with COVID-19 if they visited a hospital for their check-up.[30] In Sudan, the media continued to report that the fragile health system was not coping with the additional strain of a pandemic. The lockdown prevented health workers from attending their place of work and many hospitals in Khartoum shut down. Women were reported to be giving birth without medical assistance, while there was no emergency assistance for those with acute medical needs. Doctors attributed the recent increase in the mortality rate to the breakdown in health services, rather than to COVID-19 itself.[108,123]

Summary RCCE and research considerations:
Consider 'whole of health' RCCE approaches which account for trade-offs of the COVID-19 response on the health system (particularly in fragile states). Take into account fears of COVID-19 infection, COVID-19 stigma, costs of accessing services, and underlying health seeking behaviours in the region. Invest in creating robust understanding of local health-seeking behaviours using epidemiological data to identify priority groups and areas. Engage and communicate frequently about changes to and availability of COVID-19 and other health services. Use social science data to jointly develop actionable recommendations with other response pillars including infection, prevention, control (IPC) to make timely adaptations to service delivery.

Response behaviours – barriers and enablers

Quarantine and curfew

Some evidence has been published on general attitudes towards quarantine and other restrictive measures such as lockdown in relation to COVID-19. Studies conducted in Iraq,[72] Jordan,[89,31] and Saudi Arabia[26,23] found a high self-reported compliance with mandatory quarantine measures during the COVID-19 pandemic (all above 90%). In contrast, two studies in Algeria reported low compliance.[88,73] It should be noted there was some ambiguity in the literature on terminology for measures that required separation: quarantine, self-isolation, self-quarantine, and shielding.

Studies from Egypt (including migrants),[19] Iran,[25] Iraq[72] and Saudi Arabia[16] found the majority to be in favour of quarantine as a measure to prevent the spread of infection, whilst studies in Saudi Arabia[27] also concluded that participants were in favour of a night-time curfew. Bahrainis were aware of the purpose of quarantine and desired more information on how to self-quarantine properly.[20] It has been noted that Islam advocates for the practice of quarantine as a way to ensure disease remains confined to one place, the Prophet Muhammad having said, "If you hear of an outbreak of plague in a land, do not enter it; and if the plague breaks out in a place while you are in it, do not leave that place."[33,85] This may account for the high level of acceptance towards quarantine amongst some population groups in the region, although the studies did not elucidate such a link.

A number of key behavioural influencers emerged in relation to quarantine. In terms of personal characteristics, age, gender, education, marital status, occupation, income and geographical location were found to have a bearing on individuals' attitudes toward quarantine in the context of COVID-19 in some settings. Young people tended to be less likely to favour or comply with quarantine measures than older people (Saudi Arabia,[23] Maghreb[41]), although this trend was reversed in Egypt.[19] In general, females were more likely to comply and be in favour with quarantine than males (Egypt,[19] Jordan,[89] Saudi Arabia [23]). This was also the case for migrants in Egypt (predominantly from Yemen, Syria and Sudan),[19] and Syrian refugees in camp settings in Jordan, where girls were restricted to their homes whilst adolescent boys spent much of their time during lockdown socialising or working.[30] A previous study about awareness of MERS-CoV in Saudi Arabia similarly found that women were more likely to adopt safety precautions than men.[28]

Barriers preventing compliance with quarantine included a lack of perceived risk among young people (Syrian refugee adolescents in Jordan,[30] young people in Maghreb[41]); the need to work (Saudi Arabia,[23] Egypt,[19] refugees and host communities in Jordan,[30] IDPs, refugees and returnees in Iraq – especially men[173]); fear of losing access to aid (IDPs, refugees and returnees in Iraq - especially women[173]); the need to buy necessities (Saudi Arabia[23]); lack of awareness of the reasons for compliance (Algeria[88]); and a lack of enforcement, implying a lack of willpower (IDPs, refugees and returnees in Iraq[173]). It was reported that many Sudanese migrants who were placed in government quarantine centres after returning from Egypt and the UAE left prior to completing the obligatory quarantine period, citing poor living conditions. Similarly, Sudanese students returning from China protested at the airport upon learning they were to be placed under quarantine.[123] In Lebanon, hundreds of people were reported to break quarantine rules to collect their salaries from the bank in March 2020.[179] Since the explosion at Beirut's port in August, which left around 30,000 people homeless, quarantine has been an impossibility for many.[36]

Summary RCCE and research considerations:
Make clear the difference between quarantine and self-isolation. Communicate clearly and consistently what support is available for those undertaking isolating measures (including when support changes). Consider community, public authority and political power dynamics. Consider local histories of quarantine and curfew and how these can be perceived as being used to curtail freedom or reinforce discrimination (drawing on social science data to highlight key issues and for advocacy purposes). Take into account gender-dynamics and other vulnerabilities (e.g., people living with disabilities). Collaborate with other sectors to ensure that policy-making reflects potential and known risks and develop / strengthen mitigation measures. Work with informal and formal leaders to develop community solidarity strategies ensuring that those at high risk and the most vulnerable and marginalised are adequately supported during quarantine.

Isolation

In the emerging literature there was a high level of general approval towards isolation of people showing symptoms of COVID-19 (Saudi Arabia,[26,27] Sudan,[29] Egypt,[19] Tunisia[15]). A survey conducted by Statista found that a high percentage of people in several countries across the region would agree to self-isolate for 14 days if diagnosed with COVID-19. People in Lebanon had the highest level of positive response, with 99%, followed by Jordan (98%), Morocco (97%), Egypt (94%), Saudi Arabia (93%) and UAE (92%).[180] However, a health ministry poll conducted in Iran in June 2020 found that only 32% of people were following the rules on self-isolation.[58] It is worth noting that in a prophetic verse, the Prophet Muhammad said, "Do not place a sick patient with a healthy person." It is possible that Islam's teachings on isolation may contribute to the high level of acceptance, although more research is required to understand whether this was actually an influencing factor in reality.[181,85] It may be worth exploring whether these teachings could be more fully harnessed in advocating for responsible voluntary self-isolation. Whilst being sensitive to the context and power dynamics, religious leaders could be engaged to explore this.

Among IDPs, refugees and returnees in Iraq, fewer than 25% indicated that they would be willing to self-isolate if they experienced symptoms of COVID-19.[72] An ACAPS study reported that IDPs in Iraq feared isolation and the resulting stigma, and were therefore unlikely to access testing.[56] According to one study in Egypt, male migrants, rural populations, less educated respondents and those who had been married were less likely to be willing to self-isolate.[19] A lack of an acceptable environment in which to self-isolate was identified as a barrier among displaced populations in Iraq.[72] This also related to migrant workers in the Gulf States, who often reported to live in crowded conditions. The fact that a large percentage of the UAE population is made up of male, young migrant workers living in high density conditions, and their failure to take precautions during home-isolation, was blamed for the high numbers of young people testing positive for COVID-19 in the country.[47] There were also reports of migrant workers forcibly isolated in crowded labour accommodation or quarantine facilities without water or critical medical care.[182] Previous studies not specific to the region documented how migrants often lacked the same rights, social support structures and access to services and resources as nationals, making quarantine particularly difficult for them, both physically and emotionally.[183]

A report from Egypt concluded that people feared isolation because they saw it as a type of punishment in which they were detained alone and completely separated from their families.[21] They also felt that their being placed in isolation amounted to broadcasting the news of their infection throughout their social networks, resulting in social harm to their families. These feelings of stigma and punishment were magnified by the way in which infected people were taken from their homes to be placed in isolation facilities.[21] No strong evidence was found about isolation as a strategy during previous disease outbreaks.

Summary RCCE and research considerations:
Assess local acceptability of isolation on the basis of religious teachings. Collaborate with local stakeholders and other partners to ensure a structured approach for consulting with different population groups (paying particular attention to those who are likely to be at high risk) to identify locally-feasible isolation strategies. Adapt RCCE for displaced peoples for whom the psychosocial impacts of isolation can be more difficult – this would necessitate the creation of safe spaces to listen to concerns and ensure that information conveyed is sensitively shared with other relevant actors and stakeholders.

Home-based care and protection of people at high risk of adverse outcomes from COVID-19

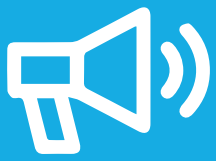
Little scientific evidence was identified on behaviours and challenges around home-care in the region, or about the protection of high-risk groups. One pre-COVID-19 study that dealt with the topic of home-care in Egyptian low-income households noted that most respondents considered homecare to be a natural part of the management of respiratory illness, and reported extensive use of pharmacy-purchased medications, including antibiotics, for mild respiratory infections.[42] A study in Syria reported that 21% of individuals considered to be at high-risk from COVID-19 were shielding for their own protection,[60] while respondents in Syria and Jordan approved of shielding as a precautionary measure for at risk groups, particularly the elderly.[40,65] In Yemen, a large COVID-19 shielding intervention was introduced that focused

at the household or extended family level. The evidence suggested that shielding resonated with a strong local tradition of protecting the elderly and the most vulnerable, whilst grouping high-risk individuals together outside of their homes was deemed socially unacceptable.[184]

In relation to care for the elderly, it is important to consider the traditional composition of households and the demographic shift that is occurring in the region. Households have traditionally been multi-generational, with material as well as psychological support mutually exchanged between generations. A religious moral code of conduct governs younger family members' obligation to honour, respect and care for their elders.[185] Recent changes in demographics including urbanisation, a decline in fertility rate, and a trend for young people to emigrate in search of work in the face of economic crises, has led to a tendency for families to become more nuclear and for intergenerational cohesion weaker.[185] In some areas this has been compounded by conflict, which can lead to early widowhood, unemployment and displacement, leaving older people more likely to be living alone and without support.[185] Meanwhile, women, who have traditionally been the main caregivers for elderly people as well as sick family members,[42,185] are becoming more engaged in the workforce.[185]

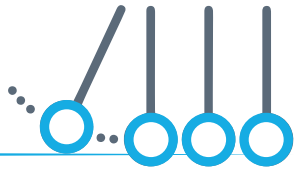
One response to this scenario, particularly in the Gulf Cooperation Council (GCC) states and the Bilad al-Sham countries, has been for wealthier families to engage migrant workers, predominantly women from Southeast Asia and Africa, to assume the role of main caregivers of elderly family members.[185,186] While this system contributes to lowering rates of institutionalisation of older people and makes it possible to maintain the traditional household composition, migrants may lack formal qualifications for aged care,[185] as well as in some cases being subject to discriminatory labour practices.[185,186]

A number of enabling policies and programmes exist in the region that promote the provision of social and/or financial support, training and information to caregivers of elderly people (Algeria, Bahrain, Egypt, Lebanon, Jordan).[185] In Tunisia, laws facilitate access to social support and healthcare for older people.[185] Some countries have policies that promote close familial residence, such as free housing on the condition that extended families live in close proximity. Laws also exist that hold family members responsible for older relatives and punish negligence. However, this regulatory environment has had the effect of lessening the pressure on states to provide pensions and health insurance to older people, leaving many without adequate support.[185]



Summary RCCE considerations:
Only promote concrete practical and acceptable ways to shield, in-line with family structures and traditions in the region – this will require preliminary consultation with affected population groups including caregivers. Address concerns about loss of livelihood and economic impact on the household. Engage closely with communities to ensure the best possible support is available for those cared for in the home. Collaborate with other stakeholders and partners to identify referral pathways (health services, psycho-social support etc.) and communicate these clearly and consistently.

4. Operational implications for RCCE response



Based on the evidence from the available scientific literature this section is designed to: **a)** guide the direction of national and country RCCE efforts to contain the virus; **b)** inform regional level operational guidance, standards and tools to strengthen implementation, monitoring and evaluation; and **c)** identify further areas of research that may require primary data collection. Relevant drivers from the BDM are referenced throughout.

- **Drivers**

  The literature review identified drivers that influence behaviours for specific population groups. Identifying pan-regional influencing factors was challenging given the broad range of contexts and population groups in the region, however certain frequently re-emerging themes were identified. These included the influence of contextual factors such as conflict and migration that affected people's access to services and resources (healthcare, testing, handwashing facilities) and the feasibility of complying with measures such as distancing and hygiene. Religion was also a key theme throughout the literature, acting in some contexts as a barrier and in others as an enabler to compliance with measures such as handwashing, distancing, mask-wearing and health seeking.

  Trust in the government is linked to people's readiness to believe information about the virus that emanated from government sources, and in turn to their ability to see the benefits of complying with certain measures and thus their willingness to comply. Trust is most often built or eroded over time and is strongly linked to historical and contemporary political events and discourses. The communication environment is very important, with people's access to factual information from sources they trust linked to their level of awareness and knowledge about COVID-19 and thus their interest, attitude and perceived ability (self-efficacy) to perform certain practices. Effective awareness campaigns and the participation of respected public figures as advocates for preventive measures were found to be key.

  Social norms and a desire to gain the approval of others, as well as a need for strong role models (reference networks) were found to be important for many actions, and stigma acted as both an enabler (encouraging handwashing for fear of stigmatisation) and a barrier (as a deterrent to accessing testing, reporting cases and accessing care). Issues of gender had implications for women's access to healthcare, as well as their likelihood to comply with distancing measures, since women in the region tended to be less likely to spend time outside working or socialising than men.

  At the individual level, a combination of the factors outlined impacted people's awareness and knowledge, attitude, interest, self-efficacy and thus their intention to carry out certain practices. The perceived risk or potential gains of an action were key, highlighting the importance of credible and trustworthy information in helping people to weigh up the risks of doing or not doing a certain action. Emotions – particularly fear and disgust – were also important drivers that (with due care) could be positively harnessed in encouraging specific behaviours such as handwashing and immunisation.

Personal characteristics (age, gender, education level, income, occupation and familial role) were determinants to health seeking and the adoption of risk or risk-reducing behaviours. In general, men and those with lower incomes and a lower level of education were less likely to adopt preventive measures and were often less knowledgeable about the reasons for adopting such measures. The underlying reasons for this can be due to a variety of issues including degree of access to services and information, living conditions, livelihoods, and social norms around the role of certain individuals or groups in society.

- ## Harnessing drivers for RCCE strategies

For any given action and any given individual or group, a number of drivers operating at different levels will influence each other and ultimately, the relevant behaviour at the individual level. It is the task of those designing RCCE strategies to identify the different drivers for that behaviour and that target group, identify which are barriers and which are enablers to the desired action, and consider creative ways to both address the barriers and harness the enablers. The solution may be multi-pronged, addressing aspects of the structural environment, the social environment and individual cognitive processes. Identifying a solution requires granular research on specific groups to understand their current and emerging behaviours, their knowledge and attitudes towards those behaviours and their underlying drivers. In conjunction, research should be carried out to understand the communication ecosystem of which the group is a part, their communication preferences and their most trusted sources and channels of information. Messages and engagement methods should ideally be designed in collaboration with the target group, should be tested prior to roll out, and should be monitored to see whether the desired behaviour change is occurring and adapted accordingly over time.

A helpful example of this is Watson et al.'s 2020 qualitative multi-method study of motivational drivers and other handwashing determinants for children in an internally displaced person's camp in Iraq.[77] The research identified the determinants of handwashing behaviour to be familial role, access to and quality of handwashing resources and facilities, and level of exposure to hygiene promotion. Accordingly, as well as enhancing access, they found that social norms could be leveraged to encourage handwashing behaviour, and that the motivational drivers of children, including play, nurture, affiliation and love, could be incorporated into hygiene promotion activities.

Another positive example of the targeted approach is the RCCE strategy designed by UNICEF to reach labour expatriate workers employed in small enterprises and the informal sector in Oman. The strategy identified the main expatriate worker groups and relevant influential groups; the behaviours that needed to be changed and strategies to achieve these changes; the key information to be communicated and the most appropriate channels though which to do so.[17] Focusing on COVID-19, the RCCE strategy UNICEF produced for Lebanon is an important case study as it is based on the socio-ecological model of behaviour change and takes into account the various factors that influence behaviours across the different levels of the model.[187]

- **Regional considerations**

  The studies included in this review highlight a number of areas that need to be considered in designing RCCE strategies in the Middle East and North Africa region.

  - Key target groups require specific interventions.

    Due to the lower awareness and compliance among men in general, specific strategies could be designed to engage men and address the barriers that prevent them from engaging in risk reduction behaviours. While structural factors such as the need to work must be considered, it may also be useful to appeal to a sense of social responsibility, such as their role in protecting female or elderly members of their families. Specific approaches should also be designed to engage young people who perceive themselves to have limited risk, highlighting the risks but also incorporating the notion of social responsibility and their collective duty to protect all community members. Conversely, specific campaigns should target the elderly, who may have different communication preferences from young people (being less inclined to use the Internet), and have less access to information overall. Efforts also need to be made to reach those with lower income, and those with a lower education level, taking into account language preferences and literacy. In each case, the target group will need to be well understood, and their communication preferences and levels of access to services and information established. Studies suggested, for example, that to reach low income families in Egypt it was necessary to use television, community health workers and other local community partners;[19] whilst in Saudi Arabia, low income populations could be directly engaged at shopping malls and grocery stores, as well as sports stadiums and Friday prayers.[27] Refugees and IDPs require specific interventions, both those residing in camps, and also those living outside the camp system, in host communities or with relatives.[170] Although refugees outside camps may be engaged through targeted interventions in mainstream media, these should be designed differently to campaigns intended for the general population. Migrants also have specific challenges and may have different communication preferences from the general population. In the Gulf States, migrant workers have been identified as a priority group that have low knowledge about COVID-19[109] and who tend to miss out on the social-media focused awareness campaigns favoured by governments and readily accessed by the broader population.[188] In Egypt, it was recommended to use television and the Ministry of Health and Population website to reach migrant populations.[19]

  - Different populations will respond to different influencers.

    For each specific group, it is necessary to map the key trusted influencers and interlocutors and engage with these multiple stakeholders. In Egypt, it was recommended to engage with popular television hosts to promote positive prevention behaviours.[19] In the UAE, studies suggested involving Islamic scholars in lectures about the value of alcohol-based hand-rub. In other cases, engaging peers to promote certain behaviours has been shown to be effective.[83,131]

  - Religious teachings can be harnessed as an enabler for positive behaviours.

    Religious teachings can be well aligned with public health advice about quarantine, isolation, hygiene and health seeking. These can be harnessed to promote positive behaviour. To do this, it is necessary to understand the values and moral norms

that influence certain behaviours within a group, and for messages to be in line with those values and norms, not opposed to them. Messages should be crafted from within a group, not extraneously, and by actors who have the legitimacy to speak to the group and to redefine norms or realign beliefs with practices. A literature review on mass gatherings found that "With sufficient cultural knowledge and creativity, … health-harming practices can be redefined as going against the group norms, or health-promoting practices may be defined as expressing such norms."[99] As described above, a notable example is the action of the Grand Mufti of Saudi Arabia, who defined mask-wearing to be different from "covering the face" in order to enable pilgrims to wear a mask even during the sacred state of Ihram, when covering the face would usually be forbidden.[99] In some contexts, however, it may not always be appropriate to engage with religious leaders, given the sensitivities and conflicts that exist in the religion. The religious and political context (both nationally and at the sub-national level) must be taken into account.

- Social norms can be harnessed, modified or created to enable positive behaviours.

  In general, people behave in ways they believe to be acceptable and expected by others in their society (injunctive norms), and believe they should do things that other people do (descriptive norms). As such, if improving hand hygiene is the goal, it is possible to design interventions that increase the perceived social support for handwashing,[76] and enhance the perception that other people are washing their hands frequently.[77] Positive social norms and values can be encouraged and harnessed (such as respect and protection for the elderly), while norms that pose more of a risk, such as sharing hoses during waterpipe smoking sessions, can be addressed by explaining the risks and proposing alternative behaviours that will be acceptable to people, such as bringing their own hose from home. Such solutions are best designed in collaboration with the target community.

- Content should be relevant to the target group.

  For each target group, it is important to take time to find out what they already know, what information they are lacking and what they would like to know more about. In this way, messages will be relevant and useful and message fatigue can be avoided. In some instances, for example, it may be useful to provide information about germ theory to allow people to understand why certain practices will help prevent infection or why certain treatments will or will not be effective.[42] Some populations may have specific concerns that need to be addressed. In the context of Syrian refugees in Lebanon, for example, the need to communicate that they can access medical assistance without penalty if they experience COVID-19-like symptoms, even if they lack legal residence, was important.[189] In Syria, it was recommended to provide information to people about how they can comply with measures without jeopardising their livelihoods.[60]

- Stigma and psychosocial wellbeing should be addressed in communications.

  Stigma around COVID-19 has emerged as a deterrent to practices such as testing, case reporting and health seeking. There are numerous examples of specific populations and minorities being singled out and labelled as carriers of the disease (e.g. foreigners in Egypt). Care should be taken in formulating messaging and approaches to avoid the stigmatisation of certain groups. The language used in communication campaigns matters. For example, referring to 'transmission' in general

rather than to 'infecting others' or 'spreading the virus' may be beneficial. The IFRC, UNICEF and WHO have developed a guide to preventing and addressing social stigma. It outlines terminology to use and ways to avoid assigning blame to specific groups, and should be referred to across the region.[190] It is also important to be mindful of people's psychosocial wellbeing and consider including messages that offer ways to improve and maintain this. In the case of supporting adolescent refugees in Jordan, for example, various activities were recommended including providing information about financial support, establishing hotlines to discuss violence and abuse, incorporating positive coping strategies across programmes (e.g., to avoid alcohol and drugs) and supporting youth to be involved in volunteer activities.[30]

- People should be active agents of health prevention, detection and response.

  In the Maghreb, low levels of trust in the government and health service providers has been attributed to the long-term lack of 'health democracy' and the failure to provide opportunities for people to be involved in the decisions that affect them.[41] In the context of a pandemic, certain decisions needs to be made quickly and at the central level, yet response actors should continuously seek and use opportunities to meaningfully involve communities and identify locally appropriate solutions. While movement restrictions and lockdown measures may have previously limited the feasibility for inclusive and local engagement, governments and partners should now invest in direct interactions and dialogue with affected and at-risk populations. RCCE strategies are likely to be more successful if they are co-designed through community-centred approaches, capitalising on already existing local knowledge and networks.

- As restrictions are lifted, complacency will need to be managed, and sustainable, long-term preventive practices fostered.

  Once restrictions begin to ease and people are allowed to return to some level of normality, there is a tendency for people to relax and become complacent about following preventive measures. As measures ease across the region, RCCE strategies will need to address this by continuing to provide information about the level of risk present and encouraging people to continue to practice behaviours to protect themselves and others. Risk communication approaches and content as well as community engagement strategies will need to evolve and adapt from a context of emergency and uncertainty to one of status quo, encouraging sustainable, habitual behaviour. RCCE will need to contribute to shifting social norms and maintaining and supporting those new norms over time.

• Recommendations for RCCE

These recommendations focus on the initial themes identified in the literature review that should be considered in efforts to design RCCE strategies to contain and manage COVID-19 in countries across the MENA region. Due to the broad nature of the review, these recommendations are pan-regional, not country- or population-specific. They should be seen to be a starting point for further research that could provide more granular and nuanced consideration of issues in specific contexts.

Understanding contexts, people, behaviours and practices

Substantial efforts have been made to share information on COVID-19 at large scale. There is now a need and opportunity to be more systematic about measuring behaviour

change. This requires investment to be made in ongoing monitoring and evaluation over time, and must acknowledge that behavioural changes are not only a result of RCCE but are also linked to the access and quality of service delivery related to the response.

- Conduct formative research and monitoring for specific strategies or interventions

  In order for RCCE interventions to lead to real behaviour change, attempts should be made to avoid standard default interventions (e.g. broad awareness campaigns) that do not address the specific barriers or enablers relevant to a specific behaviour for a specific group of people in a specific context. Formative research, done at local level and including local researchers, should be carried out to understand the key behavioural drivers motivating relevant behaviours. Evidence and insights generated should then be used to build targeted strategies. Given the dynamic of the COVID-19 pandemic, people's priorities, practices and behaviours are constantly evolving and this information will need to be regularly updated using a mixed-method approach with different population groups as feasible and appropriate (e.g., in-person focus group discussions and interviews, telephone interviews, online surveys and polls). The level at which to direct interventions should be identified (e.g. individual, household, community, broader society) and the various entry points. In some cases it may be appropriate for interventions to be multilevel and multi-pronged, with ongoing monitoring and analysis built in from the start.

- Capitalise on best practices

  While the literature highlighted that there is a range of practical examples and lessons learned, a structured approach should be developed to document and share evidence on what has and is working well and why. This should include analysis of strategies and targeted actions that have worked at scale or have potential to work at scale, and analysis of strategies tailored to localised needs and priorities, including engagement with different vulnerable and marginalised population groups.

- Carry out research to understand the communication environment

  Formative research should also involve communication ecosystem mapping and political economy analysis to better understand the contextual environment and the ways in which different groups prefer to and are able to receive and share information. Mapping should also include the potential use of digital RCCE strategies as well as effective ways to communicate with population groups with low levels of digital literacy. As described above, social media has high penetration and can effectively reach many people in the Gulf States, yet some population groups such as migrant workers, may have reduced online access and could be left behind if an alternative and more appropriate communication channel is not identified.

- Invest in the rapid operationalisation of community knowledge and feedback

  Learning from communities themselves is critical to building trust and improving the acceptability of public health measures. The timely and ongoing collection of community feedback must be used to help adapt and improve RCCE strategies, and the service delivery of the wider response. In some contexts, this might require the reassessment of the mechanisms used to collect and convey information, and the relevance of information in circulation. It may be necessary to evaluate gaps by triangulating information from different sources to identify common trends in

perceptions, behaviours and knowledge and how these can be addressed. Defining overarching themes and modalities for data collection in line with key indicators will further help to ensure data collected is usable and useful. Local actors and frontline workers should be involved in the analysis of data to ensure findings are appropriate and applicable. Barriers to closing the feedback loop should be discussed, and ways to mitigate them put in place. Overall, it is essential that the priority needs and concerns of communities are at the forefront of response interventions.

Risk communication

- Address barriers and harness enablers to both risk communications and community engagement

  As well as addressing barriers and bottlenecks and identifying ways around those, attention should be paid to enablers to risk communications and community engagement. Enablers should be harnessed in creative ways, using strategies such as positive norms promotion and the positive deviant approach. With regard to religion, for example, Islam has strong and highly relevant teachings about quarantine, isolation, hygiene and health-seeking. These teachings could be further harnessed, in collaboration with religious leaders where relevant, to encourage people to voluntarily adopt positive behaviours in line with their faith.

- Identify misinformation and disinformation

  Mis- and disinformation proliferate in disease outbreaks and evolving scientific evidence can create a vaccum that is filled by speculation. Rumours often reflect underlying anxieties or pre-held social or political positions and beliefs and it is important to appreciate and address their underlying causes. Identifying and addressing incorrect information rapidly can be very effective and creates space for reliable information to circulate. It is also necessary to assess the extent to which different population groups are able to adapt to (constantly) evolving guidance and how they are deal with conflicting information. In practice, this necessitates fostering honest and consistent dialogue about new evidence and knowledge. Multi-agency platforms should be used to develop communication about emerging evidence that can be furthered tailored to local contexts.

- Ensure credible sources and types of information

  Communications are most effective when they are solution-focused, and promote self-efficacy, hope and agency. Building on existing strengths can help mitigate fear and foster compliance with public health recommendations.

- Identify and communicate risks specific to population groups

  Adoption of preventative health behaviours is correlated with perceived risk of COVID-19. Analysis confirms that perceptions of COVID-19 risk are variable across the region. Communications about risk should be as closely tailored to individual groups as is feasible. Considerations of risk must include dimensions beyond biomedical risks and take account of risks associated with health, behaviour, socio-economic realities, psycho-social impact and the policy environment. Meaningful communication should also acknowledge local realities as people face multiple crisis. For many in the region, COVID-19 is not their upmost priority and there are impediments to incorporating related public health measures into their daily lives.

It is important to address the wider (secondary) impacts of COVID-19, how these may affect the population over time, and how longer-term negative impacts may be mitigated.

- Harness social media in a positive way

  Social media has considerable potential for strengthening risk communication and public health promotion in populations with high internet penetration. Behaviour of social media users is locally specific and so local assessments are needed to fully understand people's favoured channels, trusted sources of information, levels of literacy, health literacy and media literacy, and preferred languages and formats for receiving and sharing messages. As well as pushing information, social media can be effectively used to gather information and to conduct rapid polling.

Community engagement

- Reinforce trust through community engagement
  Levels of trust in the state are variable in the region, and local-specific community engagement efforts must respond accordingly. Trust takes time to build, so where possible community engagement should build on initiatives that are already successful, following the accepted principles of encouraging two-way dialogue, creating space for people to ask questions and for their needs and involvement to be reflected in future engagement. Approaches should be driven by communities, co-designed and not imposed from above, and should recognise local dynamics of power and practical realities. This is particularly relevant in fragile contexts where trust in public authority has been eroded. Consultations with different population groups and stakeholders should seek to understand how they would define success and how progress or challenges should be monitored. Strategies to engender trust in public health measures are essential everywhere, but need particular attention in contexts of poor leadership, weak governance and conflict.

- Identify trusted voices and work with people's faith

  It is important to identify trusted experts and social influencers (who are often more trusted than official sources). These stakeholders can help dispel mis- and disinformation and can be involved in constructive communication. This is particularly important in those parts of the region where there is poor trust in the state or poor public-state relations. The potential for people to be guided through their faith and for religion to influence and reinforce positive behaviour is clear, but careful consideration needs to be given to power relations, spheres of influence and potential conflicts of interest. Religious leaders have an essential role in how people interpret and apply religious teachings. It is important that religious leaders and scholars are involved in response efforts as they influence the interpretation and application of religious teachings and must support decisions related to the adaptation of religious practices. They can help to ensure that effective measures of infection prevention and control are set at mosques, within family homes, and a range of public settings.

- Support those receiving home care or being shielded

  There remains limited evidence about home care and the shielding of vulnerable populations in the region. For vulnerable people to be willing to shield themselves, high-risk individuals and the communities they live in must trust in the public health response and the measures that are expected of them. In the MENA region it is

important that the wider community acts as a support system in any shielding efforts. Trusted community and institutional actors should be identified and fully engaged in the decision-making processes and in implementation. Effective communication between caregivers at home and health professionals is essential to ensure adequate care if being provided and to link with referral services. In settings where there is limited access to communication technology or response hotlines, alternative options such as shared phones, and/or regular safe visits from health workers should be considered. Local actors can help develop and adapt guidance to reflect local culture, conditions, capacities, and available resources, and ensure information is disseminated through trusted and influential formal and informal channels. Shielding vulnerable people remains extremely complex for displaced people living in camps and it is essential that they are fully and effectively engaged in discussions relating to the public health measures that affect them.

- Work towards regional cooperation and collaboration

  Noncompliance and complacency towards COVID-19 measures are being observed globally as public health restrictions continue. The pandemic has highlighted geo-political tensions and the economic impact is stark. COVID-19 has identified the need for strengthened global coordination and collective action for a coherent response. This is even more important between MENA countries, as it is a region where commonalities can be used to the advantage of all. Shared goals and consistent approaches to communication and particularly community engagement should be mutually reinforcing among key population groups with shared cultural, social or religious values, and these can then be further tailored to the most local context as appropriate. RCCE partners must share information in a timely manner and agree joint approaches to collaborate with other response pillars and decision-makers, creating positive collective action.

• Recommendations for further research and analysis

- The review found that available evidence was skewed towards certain countries in the region, and data was scarce for a number of countries, particularly the Maghreb (especially Libya). Further research should pay particular attention to overcoming these gaps. The Gulf Cooperation Council states were generally well-represented (except for Bahrain and Oman), but there were few studies that focused on the large migrant populations in these countries. Further research should incorporate these populations.

- Relevant to all population groups is the need to gain a better understanding of the degree to which people feel engaged in the response to COVID-19. RCCE strategies should support and encourage people to assume a level of self-responsibility and agency as the world moves towards a ‘new normal’. People are more likely to be engaged over a longer period of time if they are consulted and play an active part in decision-making processes, and if they feel that their involvement is meaningful and has an impact on the response and trajectory of the outbreak. All research should aim to build a high level of engagement and not be extractive, particularly when interacting with population groups who are already under substantial pressure.

- There was more evidence available on some topics (e.g. handwashing) than others (e.g. testing, case reporting, contact tracing). Data was lacking on the behavioural influencers related to detection and response measures, including attitudes and behaviours toward testing and contact tracing, and perhaps surprisingly, quarantine and isolation. Further research is needed to address these gaps, particularly the underlying reasons why people may or may not report for testing, and the challenges around complying with quarantine or isolation measures for different population groups in different contexts.

- The review did not focus on the secondary effects of certain measures, such as quarantine, except where these were highlighted as a deterrent to compliance. In order for prevention, detection and response behaviours to be sustainable, greater attention should be paid to the secondary affects and ways to mitigate these, to avoid a scenario in which “the cure is worse than the disease”.

- Further qualitative research is also needed on the secondary health impacts of COVID-19 and the corresponding shifts in people’s health-seeking behaviours for other acute and chronic illness.

- There was little available evidence about attitudes toward a COVID-19 vaccine, but other studies highlight that vaccine hesitancy is common across the region. Research in this area is essential. Some lessons may be learned from other disease outbreaks (e.g. Ebola) regarding the introduction of new vaccines, and there is potential for RCCE partners to build stronger links to existing multi-disciplinary groups carrying out vaccine research.

- COVID-19 public health measures such as lockdowns and quarantine have led to an increase in gender-based violence with particular impact of women and children. More contextual research is needed to understand how this affects those at risk to adopt preventive and risk reduction behaviours in the context of COVID-19.

- The available literature was biased towards certain methods. In general, there was a dearth of qualitative research on the topics under investigation. Research undertaken in the context of COVID-19 was mainly restricted to online quantitative surveys, which interrogated people’s actual practices or their knowledge about or attitudes toward certain practices. Due to the nature of the surveys, analysis was not able to delve deeper into why people did or did not do certain things. As restrictions ease, efforts should be made to conduct in-depth qualitative research with specific target populations to better understand key drivers to relevant behaviours. Methodologically, it is important to better understand how deploying remote RCCE approaches due to COVID-19 distance restrictions may impact the type and quality of engagement, and may effect RCCE in the longer-term.

- Community feedback should be collected systematically (e.g., through direct interactions, accountability mechanisms like hotlines and surveys) and should be regularly analysed and monitored to adapt and improve RCCE strategies and inform the wider response and different services related to it. Although the importance of community feedback has gained traction over recent years, there remains a need to advocate for its use, particularly with government partners who may have limited prior experience with this kind of data.

- There is a risk of overemphasising data collection and then not analysing or using the data in meaningful ways. All research should commit to sharing data and analysis in a timely manner and in a format that can be used to strengthen response operations.

- This review did not include information on people's communication preferences. To inform the design of effective RCCE strategies, formative research should be conducted to understand the communication ecosystem in specific contexts, including people's access to and preference for certain communication channels, language preferences, key trusted influencers or interlocutors, and the power dynamics around the development and sharing of knowledge and information.

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Annex 1. Detailed methodology

Study approach

A 'structured' literature review was conducted in order to maintain research integrity whilst accommodating the operational urgency of this project. Derived from the accepted methodologies for systematic reviews, a structured review follows a rigorous process that includes defined study selection, inclusion and exclusion criteria, but does not seek to identify and incorporate every relevant paper or document. Rather, it focuses on the synthesis being thematically comprehensive and identifying potentially relevant papers to provide a sampling framework. The final synthesis aims to present all relevant themes that could have been identified and achieve 'conceptual saturation' (whereby a point is reached where no new ideas are obtained from further data searches), while not including every relevant paper.191 The search strategy was intended to be flexible and iterative, with a view to most adequately addressing the core research questions. A presentation of the inception report was made to the Regional Interagency RCCE Working Group, and feedback from partners incorporated into the methodology.

Following completion of the search and selection process, a 'thematic synthesis' methodology was used to carry out the analysis and synthesis of findings. Thematic synthesis has three stages: the coding of relevant text; the development of ‹descriptive themes›; and the generation of ‹analytical themes›. The descriptive themes can be considered accounts or summaries of aspects of the primary studies, while the analytical themes go beyond the primary studies to reflect on and interpret the findings of the broader body of literature. Through this process, new understandings can be generated that may not be gained from any one study alone.[192] Thematic synthesis was developed in response to a need to conduct reviews that maintained the key principles of systematic review, but that were suited to addressing questions related to the appropriateness, acceptability and effectiveness of interventions.[193] As such, it is a methodology suited to producing findings and analysis that are operationally meaningful and usable.

Step 1. Defining the research questions

The primary research question guiding the literature review, as set out by UNICEF in the Terms of Reference, asked what are the socio-normative influencers and cultural predictors for the sustained practice of COVID-19 prevention and risk reduction behaviours in the MENA region?

The Terms of Reference outlined a number of measures to prevent, detect and respond to COVID-19 that will likely be the focus of the next generation of RCCE strategies. A number of targeted research questions (see Table 3) were identified about the behavioural influencers that may act as either barriers or enablers to the adoption of these measures (see Table 1 in section 2). Each prevention, detection or response measure is addressed by two questions: the first aims to identify the existing and emerging behaviours relevant to the measure, and the second aims to identify the factors (barriers, bottlenecks and enablers) that influence or predict these behaviours. The questions were refined and additional lines of enquiry added in consultation with UNICEF. These questions formed the basis of the search terms and inclusion criteria for the literature search.

Table 3: Research questions

Category	Theme	Question
Prevention	Hand hygiene, decontamination of surfaces, respiratory hygiene	What behaviours exist or are emerging relevant to hand hygiene practices in the MENA region? What factors influence or predict behaviour relevant to hand hygiene practices in the MENA region? What behaviours exist or are emerging relevant to the decontamination of surfaces in the MENA region? What factors influence or predict behaviour relevant to the decontamination of surfaces in the MENA region? What behaviours exist or are emerging relevant to respiratory hygiene (cough etiquette, use of masks/face coverings) in the MENA region? What factors influence or predict behaviour relevant to respiratory hygiene (cough etiquette, use of masks/face coverings) in the MENA region?
	Physical distancing	What behaviours exist or are emerging relevant to the use of contact or non-contact greetings in the MENA region? What factors influence or predict behaviour relevant to the use of contact or non-contact greetings in the MENA region? What behaviours exist or are emerging relevant to maintaining a given distance between individuals in the MENA region? What factors influence or predict behaviour relevant to maintaining a given distance between individuals in the MENA region? What behaviours exist or are emerging relevant to social gathering in the MENA region? What factors influence of predict behaviour relevant to social gathering in the MENA region? What behaviours exist or are emerging relevant to staying at home or avoiding public places in the MENA region? What factors influence or predict behaviour relevant to staying at home or avoiding public places in the MENA region?
	Immunisation	What behaviours exist or are emerging relevant to immunisation uptake in the MENA region? What factors influence or predict behaviour relevant to immunisation uptake in the MENA region?
Detection	Testing	What behaviours exist or are emerging relevant to testing for COVID-19 in the MENA region? What factors influence or predict behaviour relevant to testing for COVID-19 in the MENA region?

Detection	Reporting	What behaviours exist or are emerging relevant to reporting cases of COVID-19 in the MENA region? What factors influence or predict behaviour relevant to reporting cases of COVID-19 in the MENA region?
	Contact tracing	What behaviours exist or are emerging relevant to contact tracing for COVID-19 in the MENA region? What factors influence or predict behaviour relevant to contact tracing for COVID-19 in the MENA region?
	Health-seeking	What behaviours exist or are emerging relevant to health-seeking in the context of COVID-19 in the MENA region? What factors influence or predict behaviour relevant to health-seeking in the context of COVID-19 in the MENA region? What behaviours exist or are emerging relevant to antenatal and postnatal care-seeking in the context of COVID-19 in the MENA region? What factors influence or predict behaviour relevant to antenatal and postnatal care-seeking in the context of COVID-19 in the MENA region?
Response	Quarantine and isolation	What behaviours exist or are emerging relevant to compliance with voluntary quarantine in the MENA region? What factors influence or predict behaviour relevant to compliance with voluntary quarantine in the MENA region? What behaviours exist or are emerging relevant to compliance with enforced quarantine in the MENA region? What factors influence or predict behaviour relevant to compliance with enforced quarantine in the MENA region? What behaviours exist or are emerging relevant to compliance with voluntary isolation for people confirmed to have COVID-19 in the MENA region? What factors influence or predict behaviour relevant to voluntary isolation for people confirmed to have COVID-19 in the MENA region? What behaviours exist or are emerging relevant to compliance with enforced isolation for people confirmed to have COVID-19 in the MENA region? What factors influence or predict behaviour relevant to enforced isolation for people confirmed to have COVID-19 in the MENA region?

Response	Home-based care / shielding	What behaviours exist or are emerging relevant to home-based care in the context of COVID-19 in the MENA region? What factors influence or predict behaviour relevant to home-based care in the context of COVID-19 in the MENA region? What behaviours exist or are emerging relevant to home-based IPC in the context of COVID-19 in the MENA region? What factors influence or predict behaviour relevant to home-based IPC in the context of COVID-19 in the MENA region? What behaviours exist or are emerging relevant to protection of the elderly in the context of COVID-19 in the MENA region? What factors influence or predict behaviour relevant to protection of the elderly in the context of COVID-19 in the MENA region? What behaviours exist or are emerging relevant to protection of those with underlying health conditions in the context of COVID-19 in the MENA region? What factors influence or predict behaviour relevant to protection of those with underlying health conditions in the context of COVID-19 in the MENA region? What behaviours exist or are emerging relevant to protection of pregnant women in the context of COVID-19 in the MENA region? What factors influence or predict behaviour relevant to protection of pregnant women in the context of COVID-19 in the MENA region?

Step 2. Literature search

Literature was accessed in English, Arabic and French. The formal review focused on academic studies, both qualitative and quantitative, and included pre-prints and unpublished studies. To complement the formal review, additional grey literature and relevant media coverage was also accessed.

Academic literature

Searches were carried out for academic studies in English, Arabic and French using the following international databases: PubMed (incorporating MEDLINE), ProQuest (incorporating the Coronavirus Research Database, International Bibliography of the Social Sciences, Applied Social Sciences Index and Abstracts, and Sociological Abstracts), Web of Science and Google Scholar. Google Scholar searches were limited to the first five pages of search results. For specific Arabic language resources, searches were performed on EBSCO's Al Masdar (Arab World Research Source), e-Marefa, the Al Manhal platform and Research Gate, as well as targeted searches of less renowned journals ('predatory journals'). In addition, the contents of relevant journals were hand-searched, and articles forwarded by partners were reviewed for inclusion.

Search string formulae and keywords were developed on the basis of the defined research questions. The search terms were adapted or truncated as appropriate to the syntax of each database to ensure to capture different forms of each term (e.g. plurals) where applicable. The search process was intended to be iterative such that terms could be added, removed or modified dependent on the outcome of each search, to ensure relevance. In most cases, searches were limited to title, abstract and keywords. Table 4 below presents the search terms used for each database.

Where relevant, terms in both UK and US English were used. In Arabic, search terms were adapted for each of the target countries to allow for regional dialectal variations, including Algerian, Egyptian, Bahrani, Lebanese, Yemeni, Libyan, Jordanian, Moroccan, Maghrebi, Levantine and Gulf Arabic as well as Modern Standard Arabic.

Two search string formulae were used:
Search string formula 1 = Geographical area term + Prevention, detection or response measure term + Context term
Search string formula 2 = Geographical area term + Prevention, detection or response measure term – Context term

Table 4: Basic search terms

Geographical area	Prevention or risk reduction strategy	Context
Algeria; Djibouti; Egypt; Bahrain; KSA; "Kingdom of Saudi Arabia"; "Saudi Arabia"; Kuwait; Qatar; UAE; "United Arab Emirates"; Abu Dhabi; Ajman; Dubai; Fujairah; Ras Al Khaimah; Sharjah; Umm Al Quwain; Jordan; Iran; Iraq; Lebanon; Libya; Morocco; Oman; Palestine; Tunisia; Sudan; Syria; Yemen; "Middle East"; "North Africa"; "northern Africa"; MENA	Prevention; risk reduction; IPC; "hand hygiene"; handwashing; "respiratory hygiene"; "decontamination of surfaces"; "surface decontamination"; "cleaning of surfaces"; "cough etiquette"; "sneeze etiquette"; mask; "face covering"; face-covering; greeting; "social distancing"; "physical distancing"; "physical spacing"; gathering; "stay at home"; "stay-at-home"; immunisation; immunization; vaccination; lockdown; curfew; "containment measure"; testing; reporting; surveillance; "contact tracing"; health-seeking; "healthcare seeking"; "care seeking"; care-seeking"; prenatal; antenatal; ANC; postnatal; PNC; quarantine; isolation; "home care"; home-based care; "home based care"; shielding; cocooning; "home-based IPC"; "home based IPC"; protection AND elderly; protection AND comorbidities; protection AND "underlying health"; protection AND pregnancy.	COVID-19; COVID19; coronavirus

Search phrases were broken down into different combinations where appropriate to elicit manageable returns and to accommodate the search mechanisms of each database. In most of the databases, initial searches were carried out using formula 1 (including COVID-19 context terms), and a subsequent search carried out using formula 2 (excluding context terms) in order to capture more general data on the relevant behaviours outside of the context of COVID-19. In addition, purposive searching was carried out using terms related to themes thought to be relevant, such as trust and social cohesion. For Arabic literature, an initial trial found that searches could be made more relevant by adding behavioural terms such as habits, customs, traditions, procedures, rituals, manners and methods.

Grey literature
Grey literature was sourced in English and Arabic by hand searching the websites of relevant implementing partners, organisations and agencies and other specialist research sites for documents produced since the COVID-19 pandemic began. Searches were restricted to downloadable reports and papers, excluding webpage content. Relevant documents were also shared by UNICEF and other partners.

The grey literature accessed included global, regional and national guidance and action plans (where available) for the 20 countries within the scope of the assignment, country specific programmatic material, risk communication and community engagement strategies, social behaviour change communication strategies, and unpublished contextual research.

Research studies identified through the grey literature search were reviewed for relevance, and if relevant entered the formal review process, including appraisal, data extraction and synthesis. Other grey literature was used to complement the review and as contextual background.

Media
Recent media coverage was reviewed for information on current behavioural trends and perceptions relevant to COVID-19 prevention and risk reduction strategies in the region. National and international online news outlets were searched in English and Arabic, and general Google searches were performed using search terms adapted from the above table to elicit further relevant articles (see tables below for sites searched, search terms and number of records returned). These articles were not included in the formal review for data extraction, but were used to complement the review and to triangulate the data from the academic literature synthesis. In selecting media articles, a judgement was made about the quality of the article, taking into account impartiality of the author, the extent to which findings were supported by evidence, and the extent to which the findings contributed to the research question.

Social media
Where available, secondary analyses of social media content and perception data was accessed to complement the formal review of literature. This provided greater insight into current public behaviours and perceptions relevant to COVID-19 prevention and risk reduction strategies in the region.

Step 3. Literature selection and screening

The literature selection and screening process was carried out using a four-phased approach. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart was adapted to illustrate the study selection procedure.

Phase 1: Title and abstract review
The abstracts of all literature generated through the initial search were reviewed by the team to select studies relevant to the research questions and to exclude studies not meeting criteria. The following inclusion and exclusion criteria were applied to each item (Table 5):

Table 5: Inclusion criteria

Thematic relevance	Of relevance to some aspect of the defined research questions (Table 3)	Context
Geographic focus	Algeria, Djibouti, Egypt, Bahrain, KSA, Kuwait, Qatar, UAE, Jordan, Iran, Iraq, Lebanon, Libya, Morocco, Oman, Palestine, Tunisia, Sudan, Syria and Yemen	Context
Year of publication	2010 to 2020	Context
Language	English, Arabic, French	Context

Sources considered relevant were imported into a citation management software (Zotero) to facilitate inventory, cross-checking, removal of duplicates and screening by team members. Separate sub-folders were created within the Zotero library for each database and for grey literature and documents forwarded by partners to ensure the search process could be clearly tracked. This initial database search resulted in 722 articles prior to the removal of duplicates (614 in English, 3 in French and 105 in Arabic). An additional 39 studies were found through the grey literature search and forwarded by partners, resulting in a total of 761 articles. Duplicates were removed through the Zotero automatic duplicate folder, resulting in a total of 613 articles.

Phase 2: Full-text review

The full-text of 600 articles selected during phase 1 were reviewed for relevance. The full-text of the remaining 13 articles could not be accessed. During this phase, 324 articles were excluded due to lack of relevance. These articles were moved into separate folders within the Zotero library. 276 articles were taken forward into phase 3.

Phase 3: Selection of sample for extraction

Given the limited timeframe of the project, and in line with the principles of a structured review, a decision was made to select a sample of the relevant articles to be included in the final review. This was done by creating a table of relevant documents according to country and topic focus, and selecting a sample of articles to ensure representation of all countries and topics, giving preference to qualitative studies and those of most relevance. As the appraisal phase was occurring concurrently to the final selection phase, the appraisal score of studies was also used to guide the decision as to which studies to include, giving preference to those with a higher quality score. For the English and French literature, only studies and literature reviews were included. As there was less available Arabic literature, in some cases relevant essays and media articles were included in the Arabic literature sample. 124 studies were carried forward to phase 4.

Phase 4: Quality appraisal

One hundred and fourteen studies selected during phase 3 were appraised for quality and relevance (excluding 10 literature reviews). This phase occurred concurrently to phase 3 and was able to inform the final selection of studies. Studies were appraised using customised appraisal forms developed by drawing upon several previously published tools and checklists. Four different appraisal forms were used for qualitative and mixed methods studies, randomised controlled trials, observational cohort studies, and observational descriptive studies. Two reviewers worked on appraisal of the English documents, and one on the Arabic and French documents. The three reviewers were in regular discussion about the appraisal process, cross-checked appraisal samples and resolved any discrepancies through discussion. In the case of literature reviews, a judgement was made by the lead researcher about their overall quality and reliability by referring to articles referenced in the reviews.

For qualitative and mixed methods studies, the rigour of studies was assessed using an approach adapted from Bangpan et al.,194 according to criteria of reliability and usefulness, as follows:

- **Reliability criteria: 1)** sampling; **2)** data collection; **3)** data analysis; **4)** the extent to which the study findings are grounded in the data.
- **Usefulness criteria: 5)** the extent to which the findings contribute substantially to answering the research questions.

Reviewers answered yes or no to a question relating to each of the 4 reliability criteria. The study was then given an overall reliability score of low, medium or high. Next, reviewers answered yes or no to whether the study findings contributed to answering the research questions. The reliability and usefulness scores were weighed together to determine whether to retain or exclude the study. Quantitative studies were assessed according to different criteria, as shown in the quality appraisal tables below.

An appraisal method was chosen that assessed the credibility and robustness of research, while not being arduous in gathering unnecessary data about the study. The method also placed importance on the relevance of the study and the contribution it could make to the review. Since this review aimed to capture a broad landscape of existing evidence and given the limited amount of high quality research existing specifically with relevance to COVID-19, in some cases a judgement was made to include studies that would ordinarily be excluded from a formal systematic literature review.

Articles that were found to be of satisfactory quality and articles that failed the appraisal process were moved to separate folders within the Zotero library. Nine articles were excluded due to low quality, and 115 articles were taken forward for data extraction (88 in English, 24 in Arabic and 3 in French). See Annex 3 for a list of the studies included in the review by country.

Step 4. Data extraction and coding

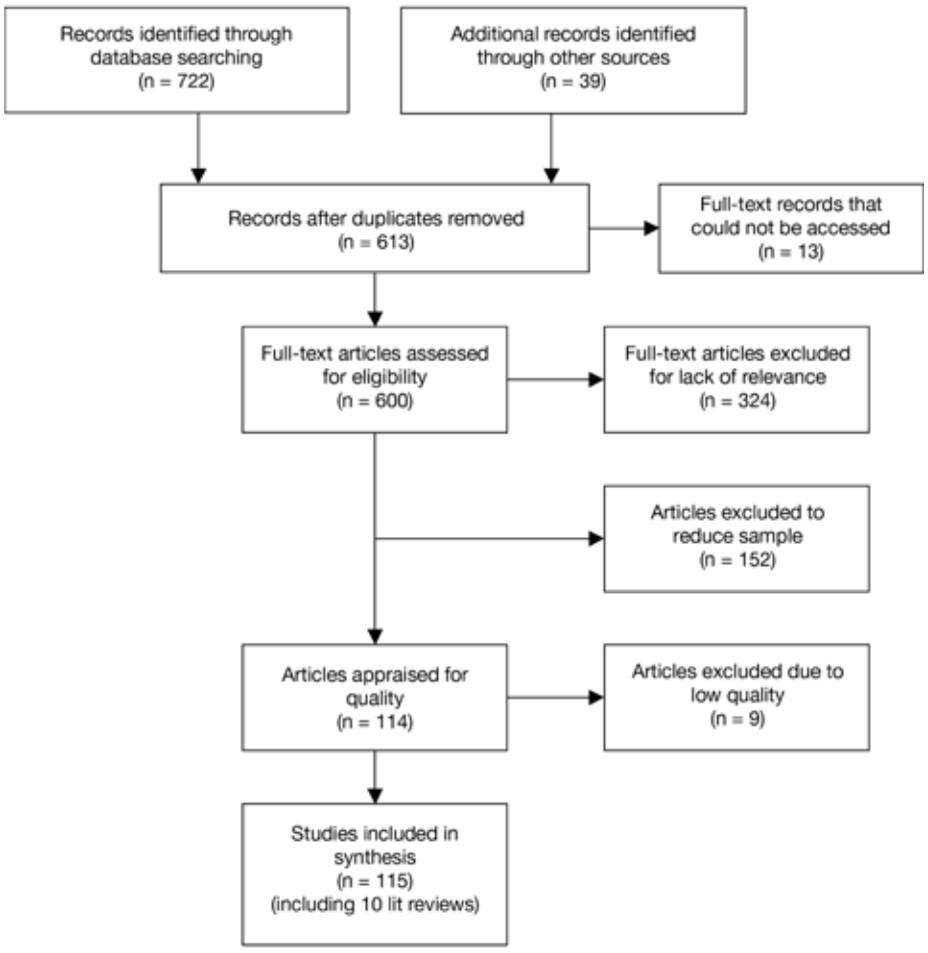
A data extraction matrix was created in an Excel spreadsheet including codes relevant to each of the prevention, detection and response measures and to relevant contextual information. The full text of each selected document was read and relevant data extracted and placed in the matrix under each code. Coding was iterative, meaning new codes were created as necessary during the process. For the English literature, the lead researcher and a second researcher worked in tandem to extract data and populate the review's data extraction matrix against agreed codes. The two researchers cross-checked samples and compared coding to ensure the process was consistent. Any inconsistencies were resolved, re-coded and new codes mutually agreed where relevant. One researcher extracted and coded the Arabic literature, and another extracted and coded the French literature, but all three researchers were in constant discussion to ensure coding was consistent across the dataset, and any code changes agreed.

Step 5. Synthesis of data

Following the data extraction process, descriptive overarching themes were identified to categorise behavioural influencers according to the Behavioural Drivers Model (BDM). These themes were input into columns in the Excel spreadsheet alongside each data item. During this process, adjustments were made to some of the BDM categories and additional categories added to ensure a best fit for the emerging data (see section on Conceptual Framework below). The data was then synthesised into summary data tables under these themes.

Finally, analytical interpretations were made from the data. This was done with a view to identifying and articulating the overarching barriers and enablers that influence and predict the sustained practice of prevention, detection and response measures in the region in a way that will be of operational value to UNICEF and partners, with a particular focus on RCCE. At this stage, in order to triangulate findings, dive deeper into some areas of enquiry and provide additional context, a number of additional articles were consulted. These included relevant articles identified in the reference lists of selected studies, documents identified through the grey literature search and forwarded by partners, media articles, and some relevant articles previously excluded from the sample. The preliminary findings were presented via two webinars to UNICEF and the Regional Interagency RCCE Working Group, and verbal and written feedback incorporated into the final report.

Figure 1: Flow chart of studies included in the review



Adapted from the PRISMA 2009 Flow Diagram

Search terms and search results

Table 6: English and French search terms and results

Database/ source	Search term	Number of hits	Number assessed
Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Um m,nm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestine OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND (Prevent* OR "risk reduction" OR "reduce risk" OR IPC OR "hand hygiene" OR handwashing OR "respiratory hygiene" OR "decontamination of surfaces" OR "surface decontamination" OR "cleaning of surfaces" OR "cough etiquette" OR "sneeze etiquette" OR mask* OR PPE OR "personal protective equipment" OR "personal protection equipment" OR greeting* OR "social distancing" OR "physical distancing" OR gathering* OR "stay at home" OR "stay-at-home" OR lockdown OR curfew OR "containment measure" OR "containment measures" OR test* OR report* OR surveillance OR "contact tracing" OR "trace contacts" OR health-seeking OR "healthcare seeking" OR "care seeking" OR quarantine OR isolat* OR "home care" OR "home-based care" OR "home based care" OR shielding OR cocooning OR "home-based IPC" OR "home based IPC" OR protection NEAR elderly OR protection NEAR comorbidit* OR protection NEAR "underlying health") AND (COVID-19 OR COVID19 OR "COVID 19" OR coronavirus)	1407	143
Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestine OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND IPC	35	3
Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestine OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND ("hand hygiene" OR handwashing OR "respiratory hygiene" OR "decontamination of surfaces" OR "surface decontamination" OR "cleaning of surfaces" OR "cough etiquette" OR "sneeze etiquette")	158	75
Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestine OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND (mask* OR "face covering" OR "face coverings" OR face-covering OR greeting* OR "social distancing" OR "physical distancing" OR "physical spacing") NOT (COVID-19 OR COVID19 OR "COVID 19" OR coronavirus)	465	18

Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestine OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND ("social gatherings") NOT (COVID-19 OR COVID19 OR "COVID 19" OR coronavirus)	13	2
Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestine OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND ("family gatherings") NOT (COVID-19 OR COVID19 OR "COVID 19" OR coronavirus)	1	0
Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestine OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND ("mass gatherings") NOT (COVID-19 OR COVID19 OR "COVID 19" OR coronavirus)	74	8
Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestine OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND ("prayer gatherings") NOT (COVID-19 OR COVID19 OR "COVID 19" OR coronavirus)	0	0
Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestine OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND (immunis* OR immuniz* OR vaccin*) AND (COVID-19 OR COVID19 OR "COVID 19")	60	0
Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestine OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND ("contact tracing")	36	0

Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestine OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND (health-seeking OR "healthcare seeking" OR "care seeking" OR care-seeking)	164	76
Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestin* OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND ("prenatal care-seeking" OR "antenatal care-seeking" OR "postnatal care-seeking" OR "perinatal care-seeking") NOT (health-seeking OR "healthcare seeking" OR "care seeking" OR care-seeking)	0	0
Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestin* OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND ("prenatal care" OR "antenatal care" OR "postnatal care" OR "perinatal care") AND (COVID-19 OR COVID19 OR "COVID 19")	1	1
Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestin* OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND (quarantine OR self-isolation) NOT (COVID-19 OR COVID19 OR "COVID 19")	165	1
Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestin* OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND ("home care" OR "home-based care" OR "home based care" OR "home-based IPC" OR "home based IPC") NOT (COVID-19 OR COVID19 OR "COVID 19")	64	9
Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestin* OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND (protection NEAR elderly OR protection NEAR comorbidities OR protection NEAR "underlying health" OR protection NEAR pregnancy) NOT (COVID-19 OR COVID19 OR "COVID 19")	7	1

Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestin* OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND (compliance OR adherence) AND health AND (trust OR cohesion)	26	2
Web of Science	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestine OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND (immunis* OR immuniz* OR vaccin*) AND uptake AND influenc*	8	6
Web of Science	(*Algérie OR Djibouti OR *Égypt OR Bahreïn OR "Arabie saoudite" OR "l'Arabie saoudite" OR "Royaume d'Arabie saoudite" OR RAS OR Koweït OR Qatar OR EAU OR "Émirats Arabes Unis" OR "Abu Dhabi" OR "Abou Dabi" OR Ajman OR Dubaï OR Fujaïrah OR "Ras el Khaïmah" OR "Ras al-Khaimah" OR "Ra's al-Khaïmah" OR Sharjah OR "Umm al-Qaïwain" OR "Oumm al Qaïwaïn" OR "Umm al-Qaiwain" OR "Umm al-Qaywayn" OR "Umm el-Qiwain" OR "Umm al-Qiwain" OR "Umm al-Quwain" OR Jordanie OR *Iran OR Perse OR *Irak OR Liban OR Libye OR Maroc OR *Oman OR Palestine OR Tunisie OR Soudan OR Syrie OR Yémen OR "Moyen-Orient" OR "Proche-Orient" OR "Afrique du Nord" OR "l'Afrique du Nord" OR MENA) AND (préven* OR "réduction des risques" OR "hygiène des mains" OR "l'hygiène des mains" OR "lavage des mains" OR "hygiène respiratoire" OR "décontamination de surfaces" OR "nettoyage de surfaces" OR "étiquette de la toux" OR "l'étiquette de la toux" OR "étiquette respiratoire" OR "l'étiquette respiratoire" OR "hygiène respiratoire" OR "l'hygiène respiratoire" OR masque* OR salutation* OR "distanciation sociale" OR "distancement social" OR "éloignement social" OR "distanciation physique" OR "distancement physique" OR "éloignement physique" OR rassemblement* OR "rester a la maison" OR confinement OR verrouillage OR couvre-feu OR "mesure de confinement" OR "mesures de confinement" OR test* OR examen OR surveillance OR immunisation OR vaccination OR "recherche des contacts" OR "relance des contacts" OR "recours aux soins" OR "soins prénatals" OR "soin prénatal" OR "soins prénataux" OR "soins anténatals" OR "soins anténataux" OR "soin postnatal" OR "soins postnatals" OR "soins postnataux" OR quarantaine OR isole* OR "soins à domicile" OR blindage OR bouclier OR protection NEAR "personnes âgées" OR protection NEAR comorbidit* OR protection NEAR "maladies sous-jacentes" OR protection NEAR grossesse OR protection NEAR gestation) AND (COVID-19 OR COVID19 OR "COVID 19" OR coronavirus)	180	4 (all in English - none in French)

Web of Science [Language: French only]	(*Algérie OR Djibouti OR *Égypt OR Bahreïn OR "Arabie saoudite" OR "lArabie saoudite" OR "Royaume dArabie saoudite" OR RAS OR Koweït OR Qatar OR EAU OR "Émirats Arabes Unis" OR "Abu Dhabi" OR "Abou Dabi" OR Ajman OR Dubaï OR Fujaïrah OR "Ras el Khaïmah" OR "Ras al-Khaimah" OR "Ras al-Khaïmah" OR Sharjah OR "Umm al-Qaïwain" OR "Oumm al Qaïwaïn" OR "Umm al-Qaiwain" OR "Umm al-Qaywayn" OR "Umm el-Qiwain" OR "Umm al-Qiwain" OR "Umm al-Quwain" OR Jordanie OR *Iran OR Perse OR *Irak OR Liban OR Libye OR Maroc OR *Oman OR Palestine OR Tunisie OR Soudan OR Syrie OR Yémen OR Moyen-Orient OR Proche-Orient OR "Afrique du Nord" OR "lAfrique du Nord" OR MENA OR Maghreb) AND (préven* OR "réduction des risques" OR "hygiène des mains" OR "lhygiène des mains" OR "lavage des mains" OR "hygiène respiratoire" OR "décontamination de surfaces" OR "nettoyage de surfaces" OR "étiquette de la toux" OR "létiquette de la toux" OR "étiquette respiratoire" OR "létiquette respiratoire" OR "hygiène respiratoire" OR "lhygiène respiratoire" OR masque* OR salutation* OR "distanciation sociale" OR "distancement social" OR "éloignement social" OR "distanciation physique" OR "distancement physique" OR "éloignement physique" OR rassemblement* OR "rester a la maison" OR confinement OR verrouillage OR couvre-feu OR "mesure de confinement" OR "mesures de confinement" OR test* OR examen OR surveillance OR immunisation OR vaccination OR "recherche des contacts" OR "relance des contacts" OR "recours aux soins" OR "soins prénatals" OR "soin prénatal" OR "soins prénataux" OR "soins anténatals" OR "soins anténataux" OR "soin postnatal" OR "soins postnatals" OR "soins postnataux" OR quarantaine OR isol* OR "soins à domicile" OR blindage OR bouclier OR protection NEAR "personnes âgées" OR protection NEAR comorbidit* OR protection NEAR "maladies sous-jacentes" OR protection NEAR grossesse OR protection NEAR gestation) AND (COVID-19 OR COVID19 OR "COVID 19" OR coronavirus)	0	0
ProQuest	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR “Kingdom of Saudi Arabia” OR “Saudi Arabia” OR Kuwait OR Qatar OR UAE OR “United Arab Emirates” OR “Abu Dhabi” OR Ajman OR Dubai OR Fujairah OR “Ras Al Khaimah” OR Sharjah OR “Umm Al Quwain” OR “Umm Al-Quwain” OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestine OR Tunisia OR Sudan OR Syria OR Yemen OR “Middle East” OR “North Africa” OR “northern Africa” OR MENA) AND (IPC OR “hand hygiene” OR handwashing OR “respiratory hygiene” OR “decontamination of surfaces” OR “surface decontamination” OR “cleaning of surfaces” OR “cough etiquette” OR “sneeze etiquette” OR mask* OR greeting* OR “social distancing” OR “physical distancing” OR “physical spacing” OR gathering* OR immunis* OR immuniz* OR vaccin* OR lockdown OR curfew OR “contact tracing” OR “trace contacts” OR prenatal OR antenatal OR ANC OR postnatal OR PNC OR quarantine OR “home care” OR “home-based care” OR “home based care” OR shielding OR cocooning OR “home-based IPC” OR “home based IPC” OR protect* NEAR elderly OR protect* NEAR comorbidit* OR protect* NEAR “underlying health” OR protect* NEAR “chronic illness” OR protect* NEAR pregnancy)	398	47

ProQuest Languages: English, French	(Algeria OR Djibouti OR Egypt OR Bahrain OR KSA OR "Kingdom of Saudi Arabia" OR "Saudi Arabia" OR Kuwait OR Qatar OR UAE OR "United Arab Emirates" OR "Abu Dhabi" OR Ajman OR Dubai OR Fujairah OR "Ras Al Khaimah" OR Sharjah OR "Umm Al Quwain" OR "Umm Al-Quwain" OR Jordan OR Iran OR Persia OR Iraq OR Lebanon OR Libya OR Morocco OR Oman OR Palestin* OR Tunisia OR Sudan OR Syria OR Yemen OR "Middle East" OR "North Africa" OR "northern Africa" OR MENA) AND (compliance OR comply OR adherence OR follow) AND (health OR guideline* OR measure*) AND (behaviour OR behavior OR trust OR cohesi* OR soci* OR politic* OR economic* OR historic* OR communit*) Date: From 2010 to 2020 Source type Books, Conference Papers & Proceedings, Dissertations & Theses, Reports, Scholarly Journals, Working Papers Document type Article, Book, Book Chapter, Case Study, Commentary, Conference, Conference Paper, Conference Proceeding, Dissertation/Thesis, Editorial, Essay, Ethnography/Culture, Government & Official Document, Letter To The Editor, Literature Review, Report, Review, Working Paper/Pre-Print Language English, French	117	1
PubMed	Health-seeking	1	0
PubMed	Quarantine and isolation	1788	0
PubMed	Home-based care / shielding	7884	0
PubMed	Health-seeking	61	0
PubMed	Quarantine and isolation	723	0
Google Scholar Formula 1 A AND B Formula 2 A AND B AND C Formula 3 A AND B AND D	A (Single country; region e.g. Algeria; MENA) B (combination of related search terms e.g. Prevention OR risk reduction OR IPC OR "hand hygiene" OR handwashing OR "respiratory hygiene") C Behaviour* OR belief OR cultur* OR religion D COVID-19 OR COVID19 OR "COVID 19" OR coronavirus [Sort by relevance]	First five pages @ 10 per page = 50 hits	46

Table 7: Arabic search terms and results

(الجزائر أو جيبوتي أو مصر أو البحرين أو السعودية أو "المملكة العربية السعودية" أو الكويت أو قطر أو الإمارات أو "الإمارات العربية المتحدة" أو "أبو ظبي" أو عجمان أو دبي أو الفجيرة أو "رأس الخيمة" " أو الأردن أو إيران أو بلاد فارس أو العراق أو لبنان أو ليبيا أو المغرب أو عمان أو فلسطين أو تونس أو السودان أو سوريا أو اليمن أو"الشرق الأوسط" أو "شمال إفريقيا" أو منطقة الشرق الأوسط وشمال أفريقيا)

و (منع* أو "تقليل المخاطر" أو منع العدوى ومكافحتها أو المراقبة أو نظام المراقبة أو "نظافة اليدين" أو غسل اليدين أو "نظافة الجهاز التنفسي" أو "تطهير الأسطح" أو " تنظيف الأسطح" أو "آداب السعال" أو "آداب العطس" أو القناع* أو "معدات الحماية الشخصية" أو تحية* أو "البعد الاجتماعي" أو " المسافة الجسدية" أو التجمع* أو "البقاء في المنزل" أو إغلاق كامل أو حظر التجول أو "تدبير الاحتواء" أو "تدابير الاحتواء" أو اختبار* أو تقرير* أو المراقبة أو "تعقب الأشخاص المحتكين بالشخص المصاب" أو "تعقب المحتكين بالمصاب" أو طلب الصحة أو "طلب الرعاية الصحية" أو "طلب الرعاية" أو الحجر أو الحجر الصحي أو عزلة الزامية أو العزلة* أو "الرعاية المنزلية" أو المكافحة أو الحماية أو "الوقاية من العدوى في المنزل ومكافحتها" أو الحماية بالقرب من المسنين أو الحماية بالقرب من التواكب المرضي* أو الحماية بالقرب من "الصحة الكامنة")

وتحصين أو تطعيم أو تلقيح أو طعم أو تمنيع أو مناعة أو حملة تحصين أو حملة تطعيم أو لقاح أو تمنيع فاعل

وسلوك الجنين أو رعاية الحوامل أو الرعاية قبل الولادة أو تأثير قبل الولادة أو سابق للولادة أو العناية بالحامل أو رعاية سابقة للولادة

ورعاية الامهات بعد الولادة أو رعاية تالية للولادة

و (مرض فيروس كورونا أو فيروس الحمى ١٩ أو "كوفيد ١٩" أو كوفد ١٩ أو جائحة الكوفيد ١٩ أو جائحة الكوفد ١٩ أو كوفيد١٩ أو كوفد١٩ أو فيروس كورونا أو فيروس الكورونا)

(الجزائر أو جيبوتي أو مصر أو البحرين أو السعودية أو "المملكة العربية السعودية" أو الكويت أو قطر أو الإمارات أو "الإمارات العربية المتحدة" أو "أبو ظبي" أو عجمان أو دبي أو الفجيرة أو "رأس الخيمة" " أو الأردن أو إيران أو بلاد فارس أو العراق أو لبنان أو ليبيا أو المغرب أو عمان أو فلسطين أو تونس أو السودان أو سوريا أو اليمن أو"الشرق الأوسط" أو "شمال إفريقيا" أو منطقة الشرق الأوسط وشمال أفريقيا) و (منع* أو "تقليل المخاطر" أو منع العدوى ومكافحتها أو المراقبة أو نظام المراقبة أو "نظافة اليدين" أو غسل اليدين أو "نظافة الجهاز التنفسي" أو "تطهير الأسطح" أو " تنظيف الأسطح" أو "آداب السعال" أو "آداب العطس" أو القناع* أو "معدات الحماية الشخصية" أو تحية* أو "البعد الاجتماعي" أو " المسافة الجسدية" أو التجمع* أو "البقاء في المنزل" أو إغلاق كامل أو حظر التجول أو "تدبير الاحتواء" أو "تدابير الاحتواء" أو اختبار* أو تقرير* أو المراقبة أو "تعقب الأشخاص المحتكين بالشخص المصاب" أو "تعقب المحتكين بالمصاب" أو طلب الصحة أو "طلب الرعاية الصحية" أو "طلب الرعاية" أو الحجر أو الحجر الصحي أو عزلة الزامية أو العزلة* أو "الرعاية المنزلية" أو المكافحة أو الحماية أو "الوقاية من العدوى في المنزل ومكافحتها" أو الحماية بالقرب من المسنين أو الحماية بالقرب من التواكب المرضي* أو الحماية بالقرب من "الصحة الكامنة") وتحصين أو تطعيم أو تلقيح أو طعم أو تمنيع أو مناعة أو حملة تحصين أو حملة تطعيم أو لقاح أو تمنيع فاعل وسلوك الجنين أو رعاية الحوامل أو الرعاية قبل الولادة أو تأثير قبل الولادة أو سابق للولادة أو العناية بالحامل أو رعاية سابقة للولادة ورعاية الامهات بعد الولادة أو رعاية تالية للولادة و (مرض فيروس كورونا أو فيروس الحمى ١٩ أو "كوفيد ١٩" أو كوفد ١٩ أو جائحة الكوفيد ١٩ أو جائحة الكوفد ١٩ أو كوفيد١٩ أو كوفد١٩ أو فيروس كورونا أو فيروس الكورونا) و (السلوك أو السلوكات أو الممارسات السلوكية أو المناهج السلوكية أو التدابير السلوكية أو العادات أو التقاليد السلوكية أو الإجراءات السلوكية أو الطقوس السلوكية أو الأساليب السلوكية أو المؤثرين)
كوفيد ١٩ ورعاية الامهات بعد الولادة في منطقة الشرق الأوسط وشمالي أفريقيا
المناهج السلوكية لكوفيد ١٩ في منطقة الشرق الأوسط وشمالي أفريقيا
المناهج السلوكية لكوفيد ١٩ في الجزائر أو جيبوتي أو مصر أو البحرين أو السعودية أو "المملكة العربية السعودية" أو الكويت أو قطر أو الإمارات أو "الإمارات العربية المتحدة" أو "أبو ظبي" أو عجمان أو دبي أو الفجيرة أو "رأس الخيمة" " أو الأردن أو إيران أو بلاد فارس أو العراق أو لبنان أو ليبيا أو المغرب أو عمان أو فلسطين أو تونس أو السودان أو سوريا أو اليمن أو"الشرق الأوسط" أو "شمال إفريقيا"
المناهج السلوكية للأمراض المعدية في منطقة الشرق الأوسط وشمالي أفريقيا
الحجر الصحي والأمراض المعدية في الجزائر أو جيبوتي أو مصر أو البحرين أو السعودية أو "المملكة العربية السعودية" أو الكويت أو قطر أو الإمارات أو "الإمارات العربية المتحدة" أو "أبو ظبي" أو عجمان أو دبي أو الفجيرة أو "رأس الخيمة" " أو الأردن أو إيران أو بلاد فارس أو العراق أو لبنان أو ليبيا أو المغرب أو عمان أو فلسطين أو تونس أو السودان أو سوريا أو اليمن أو"الشرق الأوسط" أو "شمال إفريقيا" أو منطقة الشرق الأوسط وشمال أفريقيا
كوفيد ١٩والتجمع الجماعي أو العزلة أو الحجر الصحي في الشرق الأوسط وشمال أفريقيا
فيروس كورونا والتقبيل ولعق المزارات في إيران
فيروس كورونا والتقبيل ولعق المزارات في الشرق الأوسط
فيروس كورونا والتقبيل والفرح والحزن تقاليد وعادات في منطقة الشرق الأوسط وشمال إفريقيا

Database	Input into Zotero	Extracted
Al Masdar	5	2
Al-Manhal	0	0
E-Marefa	2	1
EBSCO Host	7	0
ProQuest	2	0
Research Gate	32	6
Grey Literature	47	3
Other sources	12	7
Media	19	6

Table 8: Grey literature search (English)

Source (websites)	Input into Zotero
UNICEF	9
ICRC	15
MSF	23
WHO	18
ACAPS	8
Ground Truth Solutions	4
Shared by partners	14

Table 9: English news coverage search

Database/source	Search term	Number of hits	Number input to Zotero
Gulf News	UAE COVID-19 Prevention	374	13
Al Jazeera	Covid-19 Qatar Covid-19 Qatar Prevention Covid-19 handwashing	0	5
Al Arabiya	Covid-19 prevention	0	0
The Syria Times	Covid-19 prevention Syria	45	2
Al-Thawra	Covid-19	67	7
Maghreb Emergent	Covid-19 prevention maroc	70	1
Google	Algeria COVID-19 prevention	First 3 pages	6
Google	Covid cases in Iran	First 3 pages	5
Google	Algeria COVID-19 cases	First 3 pages	2
Ahram Online	COVID-19 > opinion	48	1
Google	saudi arabia immunization news article	First 3 pages	1
Saudi Gazette	coronavirus prevention/covid-19 prevention	6	1
Google	social media middle east covid-19	First 3 pages	3
Al Jazeera	Djibouti coronavirus	One page	1
Al-bab	Coronavirus Egypt	9 pages	4
Jordan Times	Immunization	One page	3
BahrainNews.net/ Bahrain Business News/ Bahrain News Agency Logo	Coronavirus Bahrain	One page	0
Bahrain News- Gulf Digital News	Coronavirus	100	0
Gulf News	Bahrain Social Distancing	34	1
Al Jazeera	Bahrain Social Distancing	One page	0
Google	Novetta covid-19 mena	0	0
Novetta	Coronavirus	6	0

Google	Perception covid-19 mena	First page	3
Ebsco	social media coronavirus mena	First page	0
Google	Jordan coronavirus prevention	First page	2
Arab Barometer	COVID-19	3	1
Google	Kuwait social distancing	First page	2
Google	Lebanon social distancing	First page	4
Google	Morocco social distancing	First page	1
Google	Oman social distancing	First page	3
Google	Oman coronavirus prevention	First page	0
Google	Palestine Coronavirus	First page	2
Google	Syria Coronavirus	First page	3
Google	Sudan coronavirus social distancing	First page	3
Google	Tunisia coronavirus social distancing	First page	3

Table 10: Arabic media search

Database/source	Search terms	Input to Zotero	Extracted
Independent Arabia Rasanah AGSIW Arab News TRT Arabi Al Jazeera BBC Trend Al Arabiya Al Ghad Al-Fanar media Al-Ain Human Rights Watch Lbc group Skynews Arabia Al Arab	كوفيد ١٩والتجمع الجماعي أو العزلة أو الحجر الصحي في الشرق الأوسط وشمال أفريقيا المواقف والسلوكيات الوقائية من فيروس كورونا في الشرق الأوسط وشمال إفريقيا المناهج السلوكية للأمراض المعدية في منطقة الشرق الأوسط وشمالي أفريقيا فيروس كورونا والتقبيل ولعق المزارات في إيران فيروس كورونا والتقبيل ولعق المزارات في الشرق الأوسط فيروس كورونا والتقبيل والفرح والحزن تقاليد وعادات في منطقة الشرق الأوسط وشمال إفريقيا فيروس كورونا وتجمعات أو تحية أو ترحيب أو إلقاء التحية أو تجمعات صلاة جماعية فيروس كورونا وغسل اليدين وارتداء الكمامات في الشرق الأوسط وشمال إفريقيا فيروس كورونا والرعاية المنزلية في الشرق الأوسط وشمال إفريقيا فيروس كورونا والحجر الصحي وحظر التجول في الشرق الأوسط وشمال إفريقيا فيروس كورونا والإبلاغ عن الحالات والمراقبة في الشرق الأوسط وشمال إفريقيا اختبار فيروس كورونا في الشرق الأوسط وشمال إفريقيا فيروس كورونا والتطعيم في منطقة الشرق الأوسط وشمال إفريقيا	19	6

Quality appraisal forms

Studies were appraised using customised appraisal forms developed by drawing upon several previously published tools and checklists. Four different appraisal forms were used for qualitative and mixed methods studies, randomised controlled trials, observational cohort studies, and observational descriptive studies. Two reviewers worked on appraisal of the English documents, and one on the Arabic and French documents. The three reviewers were in regular discussion about the appraisal process, cross-checked appraisal samples and resolved any discrepancies through discussion. Nine articles were immediately excluded due to low quality. As this phase occurred concurrently to the final sample selection phase, the reliability score was taken into account when narrowing the sample, with priority given to articles with a higher score.

Table 11: Quality review - Qualitative and mixed methods designs

Study	Reliability criteria				Reliability score	Usefulness criteria
	Steps taken to increase rigour in sampling?	Steps taken to increase rigour in data collection?	Steps taken to increase rigour in data analysis?	Findings grounded in the data?		Findings contribute to answering the research questions?
Akik et al (2020)	?	Yes	?	Yes	Medium	Yes
Al-Harahsheh & Boucif (2019)	?	?	Yes	Yes	Medium	Yes
Amiri et al (2019)	?	Yes	Yes	Yes	High	Yes
Brown (2019)	No	?	?	Yes	Medium/Low	Yes
Elobaid et al (2016)	Yes	Yes	Yes	?	High	Yes
Jacobsen (2020)	?	Yes	?	Yes	Medium	Yes
Khan et al (2016)	?	Yes	Yes	Yes	High	Yes
Khresheh et al (2018)	Yes	Yes	No	Yes	Medium/High	Yes
Kilshaw et al (2017)	No	Yes	?	Yes	Medium/Low	Yes
Lohiniva (2015)	No	Yes	Yes	Yes	Medium/High	Yes
Lohiniva et al (2012)	Yes	No	?	Yes	Medium	Yes
Lohiniva et al (2014)	No	Yes	Yes	Yes	Medium/High	Yes
Małachowska et al (2020)	?	?	?	Yes	Medium/Low	Yes
McLaws et al (2015)	Yes	No	?	Yes	Medium/Low	Yes
Mohammadi et al (2017)	Yes	No	Yes	Yes	Medium/High	Yes
Morowati-sharifabad et al (2018)	No	Yes	?	Yes	Medium/Low	Yes
Mourtada et al (2019)	Yes	Yes	No	Yes	Medium/High	Yes
Ng, Shaban & van de Mortel (2017)	No	Yes	Yes	Yes	Medium/High	Yes
Noubani et al (2020)	Yes	Yes	No	Yes	Medium/High	Yes
OXFAM (2020)	Yes	?	?	Yes	Medium	Yes
Parkhurst (2018)	?	Yes	No	Yes	Medium/Low	Yes
Rahmati-Najarkolaei et al (2010)	Yes	Yes	Yes	Yes	High	Yes
Sunyoto et al (2018)	No	Yes	Yes	Yes	Medium/High	Yes
Tappis et al (2020)	Yes	Yes	Yes	Yes	High	Yes
Teixidor-Toneu et al (2017)	Yes	Yes	?	Yes	High	Yes
Ng, Shaban & van de Mortel (2018)	No	?	Yes	Yes	Medium/Low	Yes
Watson et al (2020)	Yes	Yes	?	Yes	High	Yes
Webair & Bin Ghouth (2014)	Yes	Yes	Yes	Yes	High	Yes
Zarei et al (Under review)	Yes	Yes	Yes	Yes	High	Yes
Amel Keziz (2020)	?	Yes	?	Yes	Medium	Yes

Table 12: Quality review – RCTs

Study	Selection Bias		Detection + Performance Bias		Attrition bias	Reporting bias	Reliability score
	Random sequence generation	Allocation concealment	Blinding of participants + personnel	Blinding of outcomes assessments	Incomplete outcome data	Selective reporting	
Alzaher et al (2018)	Yes	No	No	No	Yes	Yes	Medium

Table 13: Quality review – Observational analytical and cohort studies

Study	Are the participants representative of the target population?	Are measurements appropriate regarding both the outcome and intervention (or exposure)?	Are there complete outcome data?	Are the confounders accounted for in the design and analysis?	During the study period, is the intervention administered (or exposure occurred) as intended?	Reliability score
Al-Mekhlafi (2017)	Yes	Yes	Yes	Yes	No	Medium/High
Abu-Gharbieh et al (2010)	Yes	Yes	No	Yes	?	Medium
Abu-Rish et al (2016)	Yes	Yes	Yes	Yes	Yes	High
Adam et al (2015)	Yes	Yes	Yes	Yes	Yes	High
Alagaili et al (2019)	Yes	Yes	?	?	Yes	Medium/High
Doocy et al (2015)	No	?	Yes	?	Yes	Medium
Elawad et al (2017)	Yes	Yes	Yes	Yes	?	High
Elkhoudri, Baali & Amor (2017)	No	Yes	Yes	Yes	Yes	Medium/High
Hagiwara et al (2013)	No	Yes	Yes	Yes	?	Medium
Hussein (2011)	?	?	No	?	Yes	Medium/Low
Kazdouh et al (2019)	?	Yes	Yes	?	Yes	Medium/High
Lyles et al (2018)	No	?	No	?	?	Low
Ng, Shaban & van de Mortel (2019)	No	Yes	No	?	Yes	Medium
REACH (2020)	Yes	No	Yes	No	Yes	Medium
Taheri Tanjani, Babanejad & Najafi (2015)	Yes	?	Yes	No	Yes	Medium
Tittle et al (2019)	Yes	Yes	No	No	?	Medium

Table 14: Quality review – Observational descriptive (online) surveys

Study	Is the sampling strategy relevant to address the research question?	Is the sample representative of the target population?	Are the measurements appropriate?	Is the risk of nonresponse bias low?	Is the statistical analysis appropriate to answer the research question?	Reliability score
Abalkhail et al (2017)	Yes	No	Yes	Yes	Yes	Medium/High
Abdelhafiz et al (2020)	Yes	?	Yes	No	Yes	Medium
Abdelrahman (2020)	No	?	Yes	Yes	Yes	Medium
Abuelgasim et al (2018)	No	No	Yes	?	Yes	Medium
Al Ahdab (2020)	No	No	Yes	?	Yes	Medium
Al-Jasser et al (2013)	?	?	Yes	No	?	Medium/Low
Al-Kandari (2011)	Yes	Yes	Yes	Yes	Yes	High
Al-Rousan & Al-Najjar (2020)	Yes	Yes	Yes	?	Yes	High
Al-Zuaidy (2020)	?	No	Yes	?	Yes	Medium
Alahdal, Basingab & Alotaibi (2020)	Yes	No	?	No	Yes	Medium
Aldarhami et al (2020)	No	No	Yes	?	Yes	Medium
Alhazmi (2019)	No	No	Yes	Yes	Yes	Medium
Alkwiese et al (2020)	?	?	Yes	?	Yes	Medium/High
Almutairi et al (2020)	?	No	Yes	No	Yes	Medium
Alqahtani et al (2017)	Yes	No	Yes	No	Yes	Medium
Alzoubi et al (2020)	Yes	Yes	Yes	No	Yes	Medium/High
Cetorelli et al (2017)	Yes	Yes	Yes	?	Yes	High
Doocy et al (2016)	?	Yes	Yes	No	Yes	Medium
El-Nemr et al (2019)	Yes	?	Yes	Yes	Yes	High
El-Zanaty (nd)	Yes	No	?	Yes	Yes	Medium/High
Erfani (2020)	Yes	No	Yes	No	Yes	Medium
Ground Truth Solutions (2020)	No	Yes	No	Yes	?	Medium
Ground Truth Solutions (2020)	No	Yes	No	Yes	?	Medium
Ground Truth Solutions (2020)	No	Yes	No	Yes	?	Medium
Hezima et al (2020)	Yes	?	Yes	Yes	Yes	Medium/High
Hijazi et al (2018)	Yes	?	Yes	Yes	Yes	Medium/High

Honarvar et al (2020)	Yes	Yes	Yes	Yes	Yes	High
Ibrahim, El Borgy & Mohammed (2014)	Yes	Yes	No	No	Yes	Medium
Kabakian-Khasho, Shayboub & El-Kak (2013)	?	No	Yes	No	Yes	Medium
Lafta, Cetorelli & Burnham (2019)	?	Yes	Yes	No	?	Medium
Madani, Boutebal & Bryant (2020)	Yes	No	Yes	?	Yes	Medium/High
Omer et al (2014)	Yes	Yes	Yes		Yes	High
Osman et al (2018)	Yes	Yes	?	Yes	Yes	High
Pengpid & Peltzer (2019)	Yes	No	?	Yes	Yes	Medium/High
Romani et al (2011)	?	No	No	Yes	?	Low
Salam et al (2010)	?	?	Yes	Yes	?	Medium
Salama & Abou El-Soud (2012)	?	No	Yes	?	?	Medium/Low
Sallam et al (2020)	Yes	?	Yes	?	Yes	Medium/High
Seyed Nematian et al (2017)	Yes	No	No	Yes	Yes	Medium/High
Tappis et al (2017)	Yes	Yes	?	No	Yes	Medium/High
UNICEF (2020)	?	?	Yes	No	Yes	Medium
Webair & Bin-Gouth (2013)	?	Yes	Yes	?	Yes	Medium/High
Zangana et al (2020)	Yes	Yes	?	Yes	No	Medium
Soliman Yousef (2020)	Yes	No	Yes	?	Yes	Medium/High
Ebrahim AH (2020)	Yes	No	Yes	?	Yes	Medium
Aourraz (2020)	?	Yes	Yes	?	?	Medium
Douaa Adel (2020)	Yes	Yes	Yes	?	Yes	High
Qahoush (2020) (IPSOS)	?	No	?	Yes	?	Low
Akl (2020)	?	?	Yes	Yes	?	Medium
Al Fokiy & Abou Al Foutouth (2020)	Yes	?	Yes	?	Yes	Medium/High
SESRI (2020)	Yes	Yes	?	Yes	Yes	High

Annex 2. The BDM: application and reflections

The BDM was designed as a living tool to be refined through use and through collaborative exploration. We identified missing dimensions from the Level 2 drivers, which we have added. We also identified drivers, listed under a specific factor, that in some cases seemed to belong elsewhere. In some cases this was due to a lack of detail in the data. For example, in the BDM, awareness and knowledge is listed under Attitude. This implies that raised awareness will lead to a change in attitude about (in this case) a specific practice. In some cases the available data highlighted only a level of awareness, but did not provide information on people's attitudes or actual behaviour. In some cases, awareness led to a higher perceived ability to perform a task (not necessarily a changed attitude toward the value of the behaviour or to an actual behaviour change), so it seemed in those instances it would be more appropriate to list awareness and knowledge under self-efficacy.

In addition, we have adapted some of the terminology to reflect an effort to identify both barriers and enablers to desired behaviours. For example, we have changed structural barriers to structural factors (which could include either barriers or enablers), cognitive biases to cognitive processes and limited rationality to level of rationality. Although we recognise that the latter are accepted terms in psychology, it seems that for our purposes of attempting to identify both barriers and enablers, the terminology is too restrictive in focusing only on the limitations.

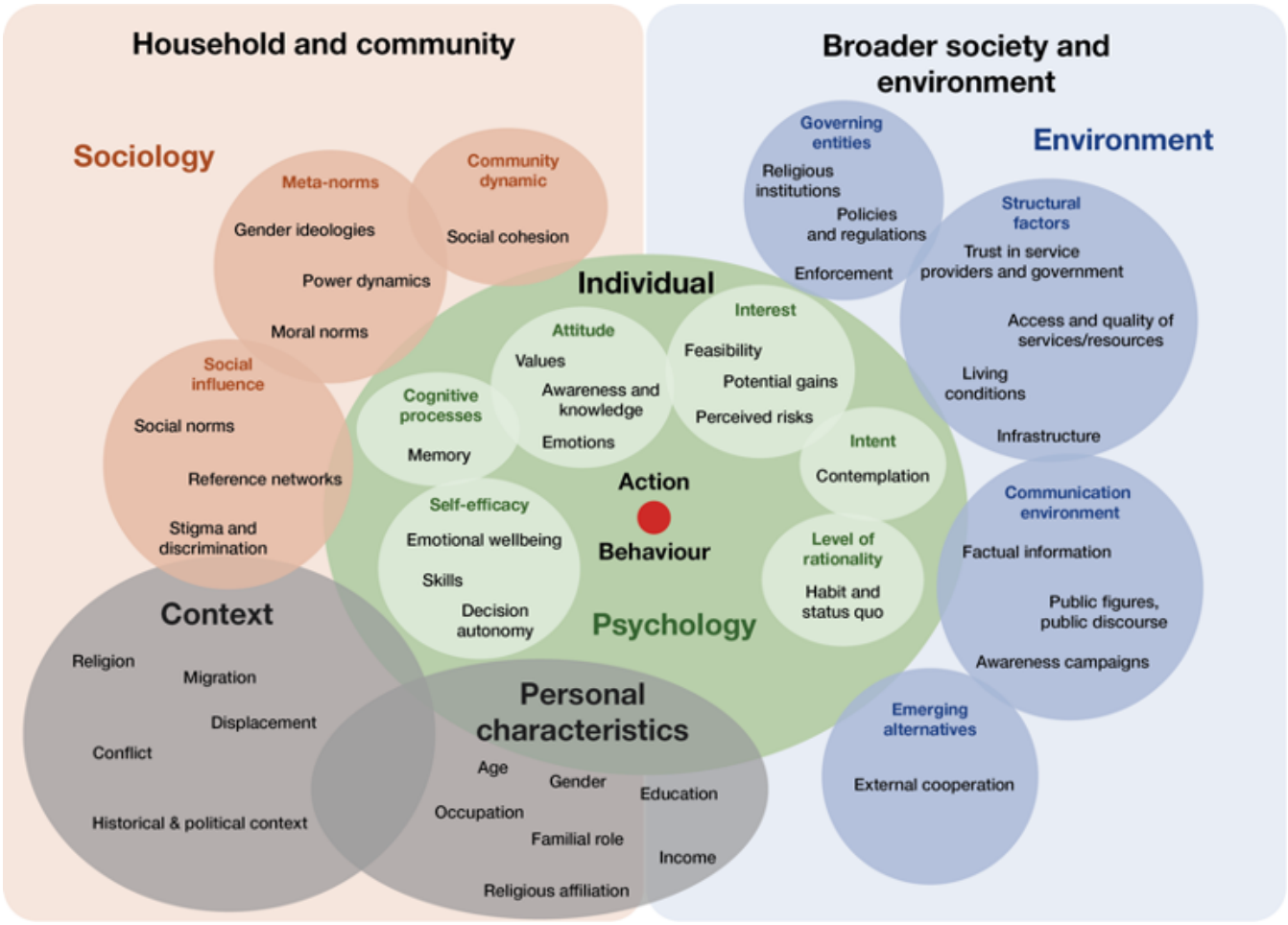
The Level 1 and 2 drivers utilised in this review are outlined in Table 2, and the barriers and enablers to each of the prevention, detection and response measures of interest are listed against these drivers in Tables 6-8 below. We included only those drivers that were identified through the review as influencing relevant behaviours. This is not to say that drivers that have not been included would not be relevant elsewhere. In particular, many of the cognitive drivers are omitted, as the available data did not provide insights into people's cognitive processes as relevant to the behaviours of interest. We have unpacked behavioural influencers as far as possible given the data, but in some cases the true underlying motivators for behaviour or attitudes were not presented. For example, we have added a Level 2 driver, "approval" under Attitude, as in a number of cases information was available about people's level of approval for a certain measure, but no additional information as to what motivates or influences this approval was presented (whether potential gains, moral norms, etc.).

It is worth noting that personal characteristics and contextual factors can cut across the other categories and layers. For example, a person's gender may affect their behaviours as influenced by gender ideologies, or their education may affect their awareness and knowledge and skills (and therefore self-efficacy or attitude). Religion (and religious affiliation) cuts across all three categories in that behaviours can be driven by personal values and beliefs (psychology), moral norms (sociology) and the activities or discourse of religious institutions (environment). To simplify the analysis, we have placed all drivers related to religion under Context.

Finally, it is worth making mention of communicative ecosystems. If we understand that individuals are part of and influenced by parts of an ecosystem, the same applies to communication. In order for the BDM to be manageable and usable, communicative processes are restricted to the category of "Communication Environment". However, the ways in which individuals and groups receive and process messages and their capacity to effectively reciprocate are influenced by drivers across all the different categories and levels.

In particular, important communication exchanges can occur through interpersonal interactions at the household or community levels, as well as via other media and through various influencers. Understanding how discourse (including misinformation as well as scientific facts) can proliferate outside of formal awareness or media campaigns, and capturing that, is of particular importance for the design of RCCE strategies.

Figure 2: Key level 1 and 2 drivers mapped across the SEM



Tables of barriers and enablers mapped to SEM and BDM models

Table 15: Barriers and enablers for prevention behaviours

Number of hits				
Domain	**Level 1 Driver**	**Level 2 Driver**	**Barriers**	**Enablers**
	Context	Religion	Prohibition of alcohol; belief that using alcohol-based handrub will make hands 'Najis' (unclean) (nurses in Iran, KSA, MENA); Pilgrims in the sacred state of "Ihram" not allowed to use scented soap, so wash their hands using only water (KSA)	Handwashing as fundamental tenet of Islam; endorsement of handwashing by Prophet Mohammed; Obligatory ritual handwashing (MENA); tolerant/ adaptive approach of religious institutions to the use of alcohol for hand-sanitiser (KSA, MENA); acceptance of alcohol handrub as not presenting a conflict with religious beliefs (healthworkers in Iran and UAE, religious scholars in UAE);
		Conflict and displacement	Children who have lost parents in conflict may lack role-models for handwashing (IDP children, Iraq)	Older siblings become role-models for handwashing (IDP children, Iraq)
	Personal characteristics	Age	Younger people less likely to wash hands (Sudan)	Older people more likely to wash hands (Sudan)
		Education	Lower education associated with decreased handwashing (produce-handlers, Qatar); children not attending school or kindergarten not receiving hygiene promotion (IDP children, Iraq)	Higher education associated with increased handwashing (produce-handlers, Qatar)
		Geographic location	People from Kuwait, UAE, Qatar, and Oman less likely to wash hands	People from Saudi Arabia and Bahrain more likely to wash hands
		Occupation		Students and government employees more likely to wash hands (Saudi Arabia, Kuwait, UAE, Qatar, Bahrain and Oman)
		Familial role		Older siblings ensure younger children wash their hands (IDP children, Iraq)
		Parity, household composition	Parents with many children less likely to enforce handwashing (IDP children, Iraq)	

Psychology	Cognitive processes	Memory	Difficulty remembering to wash hands (IDP women in Iraq, healthworkers in UAE)	No problem remembering to wash hands (IDP women, Iraq)
		Attitude	Not driven to wash hands unless visible dirt on hands; preference for running water and soap rather than hand-rub to feel clean (nurses, Egypt)	Driven to wash hands through disgust at having visible dirt on hands (nurses in Egypt, IDP women in Iraq); driven to wash hands at home after visiting dirty latrines (IDP children, Iraq); driven to wash hands out of desire to feel clean (nurses, Egypt); driven to wash hands in order to feel relaxed (IDP women, Iraq); driven to wash hands through fear of infection with COVID-19 (Algeria, migrants in Egypt)
		Awareness and knowledge	Lack of awareness of importance of handwashing to prevent disease (nurses in Egypt; produce-handlers in Qatar)	Awareness of importance of handwashing (Syria, KSA, Egypt, refugees, host communities and uni. students in Jordan, IDP women and children in Iraq, health workers and religious scholars in UAE)
	Interest	Appeal, perceived risks	Dislike alcohol smell on skin (MENA); makes hands dry, causes allergy, causes pain to wounds on hand (HWs in Egypt and Iran, IDP women in Iraq)	Majority believed no negative effects of handwashing (IDP women, Iraq)
		Affordability, efforts needed, waste	Takes time and resources (HWs and religious scholars, UAE HWs)	Financial restraints not a barrier to purchasing soap (IDPs, Iraq)
	Self-efficacy	Physical capacity		Felt able to wash hands 5 times a day (IDP women, Iraq)
		Self-image		Makes people feel more attractive (IDP women, Iraq)
			Trauma made it difficult to wash hands (IDP women, Iraq); symptoms of depression increased poor hand hygiene (adolescents, Morocco)	Handwashing made people feel more relaxed (IDP women, Iraq)

Sociology	Social influence	Descriptive norms, injunctive norms, reference networks, social pressure, stigma	Not wanting to offend patients by washing hands in their presence (HWs, Iran); beliefs neighbours disapprove of regular handwashing (IDP women, Iraq) lack of role models and social pressure to wash hands; tolerance towards working with dirty hands (nurses, Egypt); poor parental influence led to poor outcomes (IDP children, Iraq)	Beliefs people (e.g. mothers, husband) approve of handwashing (IDP women, Iraq); considered good etiquette (Tunisia, Algeria); mother strong influence; older children like to be good role models for younger children; children wash hands to avoid other children stigmatising them and their families and to gain parents' approval; mothers are expected to ensure children wash their hands (IDP children, Iraq); influenced by observing and comparing to peers; traditionally wash hands at home (HWs, UAE); important people considered good influencers (UAE)
	Meta-norms	Power dynamics, powerholders	Employees not likely to go against norms exhibited by superiors due to authoritarian culture; if doctors do not enforce handwashing, nurses will not practise it (nurses, Egypt)	Employees would be driven to follow norms exhibited by superiors due to authoritarian culture (nurses, Egypt)
		Moral norms		Hand washing linked to quality of care that reflects respect and dignity, values appreciated in Egyptian culture (nurses, Egypt); handwashing considered morally the right thing to do (UAE)

Environment	Structural factors	Access to and quality of resources, infrastructure, living conditions, conditions of workplaces and public places	Lack of soap, alcohol and sinks (HWs in Egypt and UAE, Syria focal points); lack of handwashing facilities, crowded, unsanitary conditions (Hajj); lack of safe water and soap (refugees and host communities, Jordan; IDP camps, Iraq); no electricity at latrines; dirty latrines dissuaded children from washing hands there; latrines too far; water too cold; common facilities led to them being dirty (IDP children, Iraq)	Enough soap and water (IDP camps, Iraq); dirty latrines encouraged children to wash hands after returning home; crowded living conditions can heighten social surveillance; close living conditions and spending a lot of time together are conducive to older siblings supervising young children's handwashing (IDP children, Iraq); Dirty, crowded places lead to disgust, which drives handwashing behaviour (nurses, Egypt,)
	Communication environment	Awareness campaigns		Increased handwashing due to awareness campaign (IDP children, Iraq; HWs, UAE)
	Emerging alternatives	External cooperation	People who did not wash their hands reported NGOs had put rules in place related to handwashing (doers reported no such rules) (IDP women, Iraq)	Increased handwashing due to hygiene promotion by Save the Children (IDP children, Iraq); increased handwashing following religion-relevant intervention (HWs, UAE)

Table 16: Barriers and enablers for detection behaviours

Testing				
Domain	**Level 1 Driver**	**Level 2 Driver**	**Barriers**	**Enablers**
	Personal characteristics	Age	Younger people less willing to get tested (Egypt)	Older people more willing to get tested (Egypt)
		Gender	Male migrants less willing to get tested (Egypt)	Female migrants more willing to get tested (Egypt)
		Education	Those with lower education level less willing to get tested (Egypt)	Those with higher education level more willing to get tested (Egypt)
		Marital status	Married or ever-married people less willing to get tested (Egypt)	People who had never married more likely to get tested (Egypt)
		Geographic location	Urban respondents less willing to get tested (Egypt)	Rural respondents more willing to get tested (Egypt)
	Context	Migration	Migrants less likely to take a test than non-migrants if experiencing symptoms (Egypt) (El-Zanaty)	
Sociology	Intent	Contemplation		Most people were willing to take the test if experiencing relevant symptoms (Egypt including migrants)

Reporting				
Domain	**Level 1 Driver**	**Level 2 Driver**	**Barriers**	**Enablers**
Psychology	Interest	Perceived risks, appeal	Fear of losing income as a result of reporting illness (Egypt); lack of acceptable environment in which to isolate (Iraq)	
	Attitude	Emotions (fear)	Fear of the unknown	
Sociology	Social influence	Stigma	Stigma associated with COVID-19 may deter reporting (Egypt)	No stigma associated with COVID-19 (Jordan, university students)
		Social norms	Unwillingness to report due to social norms (Iraq)	
Environment	Structural	Living conditions	Lack of acceptable environment in which to isolate (Iraq)	
			Challenges of surveillance, since people report to a variety of healthcare providers for mild illness (Egypt)	Surveillance easier for severe cases, since people tend to visit large hospitals with severe symptoms (Egypt)

Health-seeking				
Domain	**Level 1 Driver**	**Level 2 Driver**	**Barriers**	**Enablers**
	Context	Migration	Migrants less likely to visit health facility with COVID-19 symptoms than non-migrants (Egypt)	Migrants more likely to call COVID-19 hotline than non-migrants (Egypt)
		Conflict	Fear of going outside; insecurity, roadblocks, checkpoints; lack of functioning health services (Iraq, Yemen)	
		Religion	Visiting religious shrines for spiritual treatment for COVID-19; kissing and licking of shrines to kill COVID-19 (Shias, Iran); belief that only Allah can cure COVID-19 (KSA); self-medication and drinking blessed water (Sudan)	New government regulations forbid kissing shrines; rejection of this practice by Sunnis (Iran)

Psychology	Interest	Perceived risks	Choosing not to visit health facility because COVID-19-like symptoms were mild (Yemen); perception of lack of care in hospitals (Yemen)	Perception that severe respiratory infections develop if mild conditions are not treated rapidly (Egypt)
		Potential gains	Perception that COVID-19 cannot be treated at the health facility (Yemen)	
		Affordability	Not visiting health facility with COVID-19 symptoms due to lack of money (Yemen)	
	Attitude	Awareness and knowledge	Low awareness of warning signs that should trigger a visit to hospital (Iran); Not knowing where to go (Syrian refugees in Jordan)	
		Beliefs	Mothers prefer traditional medicine (Morocco); Belief that poor health is the result of ill will or envy from others [evil eye], leading to delayed treatment and preference for alternative medicine (especially women, UAE)	
			Choosing not to visit health facility with COVID-19 symptoms due to fear of getting infected; fear of lethal injection rumoured to be given to patients with COVID-19 in hospitals (Yemen);	

Sociology	Social influence	Stigma and discrimination	Lack of access to formal job market due to stigma leads to lack of access to healthcare (LGBTQ people, Lebanon); Discriminatory labour practices lead to lack of health insurance (Afghan migrants in Iran); Reluctance to visit hospital with COVID-19 symptoms due to stigma toward COVID-19 patients (uni. Students, Jordan)	
	Meta-norms	Gender ideologies, power dynamics, family roles and relationships, decision-making patterns	Women dependent on family members in emergencies; desire for women to be treated at home leads to preference for herbal medicine (UAE); Women must obtain permission from husbands to visit health facility and lack confidence to discuss healthcare (Afghan migrants, Iran); women delay seeking healthcare in order to put their home and family first (UAE, Afghan migrants in Iran)	Men thought to seek healthcare more promptly as they are free of social constraints and have a lower pain threshold compared to women (UAE)
		Migration	Migrants less likely to visit health facility with COVID-19 symptoms than non-migrants (Egypt)	Migrants more likely to call COVID-19 hotline than non-migrants (Egypt)

Environment	Communication environment	Social media	Misinformation on Facebook about potential cures for COVID-19 led people to self-medicate (Egypt)	
		Public figures	Important spiritual leader urged Shi'ites to continue visiting shrines for treatment for COVID-19 (Iran)	
	Structural factors	Access to and quality of services, infrastructure	Differential access to healthcare services depending on place of residence (Egypt); high cost of healthcare a barrier for IDPs, refugees, returnees (Iraq, Iraq, Yemen, Jordan); lack of functioning or available healthcare services and mental health support (Iraq, Yemen, IDP women in Lebanon, Afghan migrants in Iran); lack of transportation (Iraq, Yemen, Jordan); lack of available services (Morocco) and incidental costs (Sudan) reasons for use of traditional medicine; inadequate medications or equipment (refugees, Jordan); choosing not to visit health facility with COVID-19 symptoms due to perception that health facility is full or too far (Yemen)	Tendency to seek care in large hospital if suffering from severe infection (Egypt); Excellent health insurance coverage (UAE)
		Trust in service providers	Pharmacists trusted and consulted frequently during ARI episodes (Egypt); Little confidence in community health services to deal with COVID-19 outbreak (Yemen)	Pharmacists trusted and consulted frequently during ARI episodes (Egypt)
			Scrutiny by Hesba morality police in hospitals and clinics a deterrent to visiting health facilities (Iraq)	

ANC and PNC careseeking				
Domain	**Level 1 Driver**	**Level 2 Driver**	**Barriers**	**Enablers**
	Context	Conflict and displacement	Reduced ANC visits due to destruction of health facilities (Iraq); interruptions to regular maternity care and increased complications during conflict and displacement (Lebanon); insecurity, politicisation of aid, weakened health system capacity, cost of care (Yemen); fear of attacks on hospitals (Syria)	Strong culture of ANC care-seeking prior to displacement (Lebanon)
		Religion	Concealment of the pregnancy to protect child against the 'evil eye'; recitation of Quranic verses and care-seeking from a religious healer to protect and cure against 'evil eye'; attribution of miscarriage to supernatural beings in Arabic and Islamic mythology or to God's will (Qatar)	
	Personal characteristics	Income	Women from lower wealth quintiles less likely to receive ANC (Egypt, Morocco, Afghan migrants in Iran, Middle East)	
		Education	Lower education level less likely to receive ANC (Egypt, Afghan migrants in Iran, Jordan, Syria, Sudan) or use a trained birth attendant (Middle East); low literacy a barrier to receiving adequate information during ANC visits (Afghan migrants in Iran)	Higher education level associated with receiving regular ANC (Egypt, Jordan, Sudan)
		Geo location	Women from rural areas attended less PNC than those from urban areas (Morocco)	Women from urban areas attended more PNC than those from rural areas (Morocco)
		Age	Older women less likely to attend ANC (Jordan); younger women less likely to attend ANC (Morocco, refugees in Jordan)	Younger women more likely to attend ANC (Jordan); older women more likely to attend (Morocco, refugees in Jordan)
		Parity	Women with more children less likely to attend ANC/ PNC (Jordan, Morocco)	Women with less children more likely to attend ANC/PNC (Jordan, Morocco)
		Marital status	Single mothers less likely to access ANC (Morocco)	Married women more likely to access ANC (Morocco)

Psychology	Attitude	Past experience	Lack of trust in doctors due to bad past experiences (Afghan migrants in Iran)	
		Emotions (desire)	Desire for pregnancy associated with ANC use (Jordan)	Desire for pregnancy associated with ANC use (Jordan)
	Interest	Perceived risk	Fear of becoming infected with COVID-19 if visiting the hospital for ANC/ PNC (refugee and host community adolescents, Jordan); Less likely to access ANC/PNC if not experiencing health problems (Syria, Morocco)	Higher use of ANC for high-risk pregnancies (Jordan, Lebanon)
		Potential gains	Perception that ANC was not important or not a priority for the household (Syrian refugees in Jordan and Lebanon)	Perception that hospital is the safest place to give birth; husbands determined to take wife to hospital despite the costs (Afghan migrants, Iran)
	Self-efficacy	Awareness and knowledge	Lack of information leads to less use of PNC (Morocco)	High knowledge about ANC among pregnant women (Libya)
Sociology	Meta-norms	Gender ideologies	Reluctance to give birth in hospital and preference for non-trained TBAs due to male gender of obstetricians (Egypt); lack of permission from male family members to receive ANC (Syrian refugees in Jordan and Lebanon)	Ultrasound scan availability a motivator for ANC, due to preference for male child (refugees, Jordan)
		Decision-making patterns	Mothers-in-law decide, based on cost, whether women attend hospital (Afghan migrants in Iran); women's autonomy a decisive factor in using skilled birth attendant (Middle East)	
		Stigma and discrimination	Lack of good communication from service providers due to discrimination; Afghanis not admitted to hospital (Afghan migrants in Iran)	

Environment	Structural	Access to and quality of services	Lack of access or proximity to health services (Egypt, Jordan, Syrian refugees in Lebanon, Yemen, Maghreb); Cost of services and incidental costs (Egypt, Afghan migrants in Iran, Jordan, Yemen, Syrian refugees in Lebanon); lack of health insurance (Afghan migrants in Iran); use of ANC facilities affected by quality of service delivery, including good and respectful communication, and wait times (Jordan, Maghreb, Syrian refugees in Lebanon, Morocco); lack of coordination between countries (Maghreb); organisational issues at health system level (Syria); delayed prioritisation of RMNCAH interventions by humanitarian actors (Syria); lack of access to government hospitals due to lockdown during COVID-19 pandemic, with hospitals only receiving emergency cases (Jordan)	Willingness to incur high costs for ANC (Afghan migrants in Iran); willingness to access care if available (Lebanon); women more likely to return for ANC if offered quality, respectful care with information, education and opportunities for dialogue (Jordan); insured women more likely to receive adequate ANC (Jordan); availability of ultrasound scans a motivator (refugees, Jordan); community midwives program to enable access to care in conflict settings (Syria)
		Trust in service providers	Lack of trust in doctors due to past experience and lack of communication (Afghan migrants in Iran)	
		External factors – international politics	Due to international sanctions and financial limitations, Iran has limited resources for covering care leading to high out-of-pocket expenses (Iran)	
		Governing entities	Lack of coordination between countries, standardised objectives, common planning for ANC/ PNC (Maghreb)	
	Communication environment	Awareness campaign		Significant association between receiving home visits or attendance at public meetings and awareness of ANC found following awareness campaign; difference in education level no longer a factor in awareness of ANC following intervention (Sudan)

Table 17: Barriers and enablers for response behaviours

Quarantine and curfew				
Domain	**Level 1 Driver**	**Level 2 Driver**	**Barriers**	**Enablers**
	Context	Religion		Islam advocates for quarantine to ensure confinement of disease in one place
	Personal characteristics	Gender	Men and boys less likely to comply with quarantine (KSA, refugees and university students in Jordan); male migrants less likely to approve of quarantine than female migrants (Egypt)	Women and girls more likely to comply with quarantine (Saudi Arabia, refugees and university students in Jordan); Female migrants more likely to approve of quarantine than male migrants (Egypt)
		Age	Older people less likely to approve of quarantine (Egypt); younger people less likely to comply with quarantine (Saudi Arabia, Maghreb)	Younger people more likely to approve of quarantine (Egypt); older people more likely to comply with quarantine (Saudi Arabia)
		Education	People with less education less likely to approve of quarantine (Egypt)	People with more education more likely to approve of quarantine (Egypt); Higher degree holders more likely to comply with quarantine (KSA)
		Marital status	People who have ever married less likely to approve of quarantine (Egypt); migrants who have never been married less likely to approve of quarantine (Egypt); married participants less likely to comply with quarantine (university students in Jordan)	Migrants who have ever been married more likely to approve of quarantine (Egypt); People who have never married more likely to approve of quarantine (Egypt);
		Occupation	Workers less likely to approve of quarantine (Egypt); self-employed and retirees less likely to comply with quarantine (KSA); need to leave home for work a barrier to compliance with quarantine (KSA)	Unemployed more likely to approve of curfew (Egypt)
		Income	People with lower income less likely to comply with quarantine (KSA)	People with higher income more likely to comply with quarantine (KSA)
			People from rural areas less likely to approve of quarantine than those from urban areas (Egypt); areas with limited COVID-19 cases associated with reduced knowledge and practice (KSA)	People from urban areas more likely to approve of quarantine (Egypt)

Psychological drivers	Attitude	Awareness and knowledge	Lack of awareness leads to non-compliance (Algeria); Low awareness of reasons for quarantine (Bahrain)	People desire to know more about how to properly quarantine (Bahrain); High awareness of purpose of quarantine (KSA)
		Approval		High level of approval for quarantine (Egypt [including migrants], Iran, Iraq, KSA, Tunisia);
		Past experience		Existence of a culture of quarantine (Algeria)
	Interest	Appeal	Need/desire to socialise among boys (refugees and host communities, Jordan)	
		Perceived risks	Perception of low risk (due to absence of cases/ less serious cases in young people) leads to non-compliance among boys (Maghreb, Syrian refugees in Jordan)	
		Feasibility	Boys continue to work in agriculture (refugees and host communities, Jordan)	Boys work shorter shifts than previously in agriculture (refugees and host communities, Jordan)
	Self-efficacy	Support	Unable to comply with quarantine due to fear of losing access to aid (esp. women) or employment (esp. men) (displaced people, Iraq); need to leave home to purchase necessities (KSA)	
Sociological drivers	Community dynamic	Social cohesion		People under hotel quarantine bonded, cooperated and shared advice (Algeria)
Environmental drivers	Governing entities	Enforcement	Lack of enforcement a deterrent to compliance (displaced people in Iraq)	
	Communication environment	Awareness campaigns		Awareness campaign raised awareness about quarantine (KSA)

Isolation				
Domain	**Level 1 Driver**	**Level 2 Driver**	**Barriers**	**Enablers**
Psychological drivers	Interest	Potential gains	Perspective that homecare often leads to a cure for ARI, obviating the need for professional care (Egypt)	Perspective that homecare often leads to a cure for ARI, obviating the need for professional care (Egypt)
	Self-efficacy	Awareness and knowledge	Use of multiple drugs in homecare, including antibiotics, with little knowledge of their function or correct usage (Egypt)	
Sociological drivers	Meta-norms	Gender ideologies, family roles and relationships	Expectation that housewives will carry out homecare as an essential duty (Egypt); Family members, typically middle-aged daughters and daughters-in-law, carry major burden of caregiving for older relatives (MENA)	Housewives have a sense of pride in their homecare practices (Egypt); Family members, particularly daughters and daughters-in-law, play the major role of caregiver to older relatives (MENA)
		Social norms	Homecare considered a natural part of the management of respiratory illnesses (Egypt)	Homecare considered a natural part of the management of respiratory illnesses (Egypt)
	Social influence	Stigma and discrimination	Migrant in-home care-workers can be subject to discriminatory labour practices (MENA)	
Environmental drivers	Governing entities	Policies and regulations	Migrant in-home care-workers can be subject to discriminatory labour practices and sponsorship systems (MENA)	Policies and programmes promote social support to caregivers of elderly, including short-term temporary relief, financial support (Algeria), training initiatives for carers (Bahrain, Egypt, Lebanon), provision of information for carers (Jordan)
	Structural factors	Demographic transition, economic crisis, global inequalities	Increase in in-home care by full-time, live-in migrant workers can contribute to caregiving as highly classed, gendered and racialised and linked to global and local economic and social inequalities (MENA)	Increase in in-home care by full-time, live-in foreign domestic workers enables the continuation of traditional family structures and reduces rate of institutionalisation of elderly; migrant workers are both carer and companion (MENA)
			Migrant workers may lack formal qualifications for aged care (MENA)	

Protection of people at high risk of adverse outcomes from COVID-19				
Domain	**Level 1 Driver**	**Level 2 Driver**	**Barriers**	**Enablers**
	Context	Economic crisis, conflict	Lack of employment and political tensions lead to emigration, leaving elderly relatives without care; Conflict can lead to untimely widowhood, solitary living, retirement and displacement, disrupting material and social support networks of older people and fraying intergenerational ties (MENA)	
	Personal characteristics	Gender	Can influence support network of elderly and pension access due to type employment (MENA)	Can influence support network of elderly persons (Iran)
		Marital status, parity	Older people who are single, widowed or childless (particularly women) lack social support and face a higher risk of destitution (MENA)	Can influence support network of elderly person (Iran)
		Income	Influences support network of elderly person (Iran)	Can influence support network of elderly person (Iran)
		Occupation	Self-employed and informal workers (including agricultural workers and women) rarely qualify for old-age pensions; many elderly continue to work after legal retirement age (MENA)	
Psychological drivers	Attitude	Approval		High acceptance of shielding as a precaution, especially for older people (refugees and host communities, Jordan); Approval for shielding high risk people (female focal points, Syria)
	Self-efficacy	Support	Lack of support can be detrimental to quality of life of elderly (Iran)	Greater support can improve quality of life of elderly (Iran); elderly people traditionally live in multi-generational households and receive support from family members (MENA)

Sociological drivers	Meta-norms	Moral norms, familial roles and relationships, gender ideologies	Daughters and daughters-in-law have traditionally carried burden of care for older persons; Changes in marriage norms and increased entry of women into the workforce are leading to changes in multigenerational household patterns and familial roles, with implications for care of elderly (MENA)	Driven by a religious moral code of conduct to honour, respect and care for elders, extended family structures play a key role in care and wellbeing of older people; elderly people receive material and emotional support from adult children, spouses and family members; gendered patterns of care are changing (MENA); Attitude of respect and care for mothers and pregnant women (Afghan migrants, Iran)
	Community dynamic	Social cohesion	Demographic and economic changes lead to weakening of intergenerational cohesion (MENA)	
	Social influence	Social identity		Elderly people often assume key role as social safety net for their families - not only passive receivers of support and care (MENA)
Environmental drivers	Governing entities	Policies and regulations	Pro-family national constitutions and religious institutions lessened pressure on governments to establish formal public welfare systems, resulting in a lack of old-age pensions and health insurance; low pension contribution rates and increasing life expectancy put pension viability at risk (MENA)	National constitutions and religious institutions advocate for the family as the basic unit of society (MENA); policies that encourage close familial residence (Qatar); policies that foster intergenerational solidarity and access to healthcare and social assistance (Bahrain, Kuwait, Palestine, Sudan, Tunisia); families hosting older people in need (Bahrain, Tunisia); laws that hold kin responsible for older relatives (Bahrain, Jordan, Kuwait, Libya, Morocco, Palestine, Qatar, Yemen); legislation on crimes against older people (Morocco) and older family members (Kuwait)

Annex 3. Full text articles extracted for review

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