National Institute for Public Health and the Environment
Ministry of Health, Welfare and Sport

The organisation of behavioural sciences during the COVID-19 pandemic: lessons learned from an international comparative case study

RIVM

A. van Leeuwenhoeklaan 9
3721 MA Bilthoven
Postbus 1
3720 BA Bilthoven
www.rivm.nl

T 088 689 91 11

Auteurs: Danny de Vries, Marijn Stok, Tess de Valk, Marijn de Bruin

Centrum: Gezondheid & Maatschappij

Contact: saskia.euser@rivm.nl

Kenmerk:

Datum: 30-6-2023

Introduction

An effective response to the COVID-19 pandemic required large-scale behavioural change among citizens and organisations. Behavioural change is also very likely to play a crucial role in responding to possible future pandemics and other crises. Moreover, both the source of a pandemic (e.g. a respiratory virus) as well as the control measures can have major societal consequences. It is important to have effectively functioning behavioural science advisory structures, both to inform policy making and to support implementation of policies.

This international comparative case study employed literature review and interviews (with 4-6 stakeholders per country) in four countries to examine the organisation, role and impact of the behavioural sciences during the COVID-19 pandemic. In principle, behavioural sciences were defined broadly here, including aspects of relevant related social sciences (such as anthropology, sociology and public administration). The study specifically looked at the different forms in which behavioural science teams or units (such as SAGE UK[1] and the RIVM Behavioural Unit, for example) in different countries were set up, how these teams conducted research and provided policy advice, and how that advice was subsequently used. The interviews also focused on how these different aspects (setting up behavioural teams, conducting research, formulating advice based on research findings, using the advice) could be further improved. The study was conducted in Ireland, the UK, Finland and the Netherlands and aims to distil lessons learned that can be used to improve the functioning of, and advice from, behavioural science for the benefit of response to pandemics and other crises.
This report is a policy summary of the research findings; the full research and comprehensive results will be submitted for publication in the form of scientific papers in the second half of 2023.

Research questions

1. How can reliable, valid and actionable behavioural science research be developed and conducted at the time of a pandemic or other crisis?
2. Under which organisational conditions can behavioural sciences make an effective contribution to policy and management of pandemics and crises?
3. How can behavioural science be organised (in the Netherlands and internationally) to be optimally deployed in sustainable advisory structures?

[1] Scientific Advisory Group for Emergencies; see https://www.gov.uk/government/organisations/scientific-advisory-group-for-emergencies

Key findings

- For effective deployment of behavioural sciences during the COVID-19 pandemic, a mix of research methods was required, according to interviewees. To generate sound and relevant knowledge, at least a mix of longitudinal cohort and trend research, qualitative research, literature review, experimental research, and expert consultation was needed. For effective policy advice, a synthesis of results from these different research methods was required.
- Four different "routes" emerged from the study for conducting and incorporating behavioural science during covid pandemics:
  1. Rapid-response behavioural teams within the government structure (e.g. DGSC-19 corona behaviour team[2])
  2. Independent scientific advisory committees that often consisted of top external experts (e.g. SAGE UK)
  3. Supporting, often longer-standing teams or units at an independent (public health) institute (e.g. RIVM Behavioural Unit[3])
  4. External advice from a wider community of scientists and practitioners.

  In all countries, several of these routes or hybrid forms existed simultaneously, but several interviewees experienced too limited alignment between the routes.
- In order to conduct useful and relevant research and to achieve implementation of the results, behavioural scientists interviewed said an ongoing dialogue with policymakers and decision-makers was necessary, but opportunities to do so were often limited or non-existent.
- Several interviewees suggested that relevant knowledge may have gone unused because research results were not sufficiently translated into brief, non-technical and concrete advice that matched the needs of policymakers and decision-makers. Moreover, behavioural science advice could often not be explained at the table where decisions were made or the advice could not be introduced at the right time, in the right context, and by the right (knowledgeable) people. In all countries surveyed, a lack of understanding was experienced about the extent to which advice was read, used, and how research and advice could be improved.
- In all countries, several stakeholders additionally experienced a resistance to including perspectives beyond the medical-epidemiological perspective in the pandemic response. This resistance seemed strongest in the initial, highly uncertain phase of the pandemic (but remained present thereafter as well) and hampered the learning and integration of new perspectives and research methods. Although the role of behavioural sciences in advisory structures increased as the pandemic progressed, integration into advisory structures remained limited to varying degrees in all countries studied. The role of behavioural science was largely not formalised in advisory structures and often depended on individuals: when the right person was in the right place at the right time, behavioural science knowledge was utilised, but no fixed structure existed for this.
- At the time of the current study, i.e. in the endemic phase, there was broad consensus among the non-behavioural science interviewees (policymakers, communication professionals, and epidemiologists/virologists) across all countries on the importance of further integrating behavioural science insights. Behavioural science advice was used in all four countries to inform communication and policy, improve/adjust/define policy, and implement policy. At the same time, the view

[2] This is the Dutch government's COVID-19 behaviour team. More information can be found at https://www.rijksoverheid.nl/documenten/rapporten/2021/01/01/gedragsonderzoeken-naleving-coronamaatregelen (Dutch only)
[3] The Behaviour Team at the Dutch Institute for Public Health and the Environment; see https://www.rivm.nl/en/coronavirus-covid-19/research/behaviour

that important behavioural science insights have not been picked up (or not enough, or not in time) was also widely shared.
- Since the COVID-19 pandemic, the behavioural sciences are in a better position to contribute to a future outbreak than before COVID-19. Interviewees perceive that the public is aware of the importance of behavioural science insights, policymakers and decision-makers understand that the behavioural sciences are more than just a method to communicate "what to do", and specific interdisciplinary networks serving pandemic and crisis management are growing. At the same time, there are concerns around the sustainability of the structures developed and the loss of acquired knowledge during the cold phase, including as a result of sharply declining capacity due to limited or absent funding. Finally, international cooperation by behavioural scientists from all countries is seen as an important opportunity to learn from each other and increase the effectiveness of behavioural science deployment.

Implications for organisation and policy

1. A sustainable, independent, behavioural science unit or department, with sufficient capacity, up-to-date knowledge and research protocols, which can also scale up quickly in times of a pandemic or crisis, is crucial for high-quality, relevant behavioural science research during a pandemic or crisis. The rapid upscaling could be organized internally (within a public health institute, for example) or externally (academic partners and other knowledge organisations that take action). For this, agreements must be made in the cold phase, and a strong network with researchers and societal stakeholders must be set up and maintained. Good coordination with policymakers is also necessary to ensure that research fits well with knowledge needs and policy options. This also requires attention to coordination between an independent behavioural science unit and other routes of behavioural science advice (e.g. behavioural teams within the government structure). Support for international activities is additionally important so that countries can learn from each other and jointly strengthen behavioural science deployment in crisis situations.

2. Interdisciplinary working structures are important for behavioural science advice. In this way, behavioural science advice can be based on well-substantiated advice, in which the latest medical-epidemiological insights and modelling are also taken into account. Participants from various countries indicated that integrated advice (e.g. by means of an interdisciplinary central advisory body) improves the effectiveness of pandemic and crisis advice.

3. Behavioural science advice is most effective when it can be verbally explained to policymakers to clarify its relevance for underlying policy. The presence of independent behavioural science experts during moments when decisions about policy are made contributes to the usability and employability of behavioural science advice. This requires the development and maintenance of good mutual relationships and consultation structures between behavioural science experts, policy makers and decision-makers.

Methodology

A comparative international case study with a mixed methods design was conducted during December 2022 to May 2023 to answer the research questions. The study was

theory-driven (Kohatsu et al[4], 2004 ; Satterfield et al., 2009[5]) and was conducted in Ireland, United Kingdom, Finland, and the Netherlands. The three countries involved alongside the Netherlands were chosen based on three criteria: 1) substantial organisation of, and provision of advice by, the behavioural sciences during the COVID-19 pandemic; 2) some comparability with the Netherlands in terms of culture, socio-economic position, and government structure; 3) the possibility of learning from the country in question for the Dutch context.

The study consisted of a literature review, interviews with stakeholders from the four countries, and a concluding live meeting in early June where the results of the interviews were discussed with representatives from each country. In selecting the interview candidates, the aim was to speak to six key profiles in each country:

- A senior researcher at the main 'behavioural unit' in the country
- A senior manager at the main 'behavioural unit' in the country
- A senior virologist or epidemiologist who worked with behavioural scientists
- A senior policy officer who used behavioural advice in policy design
- A senior policy officer who deployed behavioural advice in designing government communications
- A senior independent scientist who was not involved in the 'Behavioural Unit'

The interviews with Dutch participants were conducted by independent researchers who were not involved with the RIVM Behavioural Unit at the time of the pandemic. The interviews with foreign participants were partly conducted by researchers who were involved with the Behavioural Unit during the pandemic. Ultimately, 21 people were interviewed (6 in Ireland, 4 in the UK, 5 in Finland, 6 in the Netherlands).

Core findings per research question

1. How can reliable, valid and actionable behavioural science research be developed and conducted at the time of a pandemic or other crisis?

A core finding from the interviews was that designing and conducting sound, actionable behavioural science research during a pandemic or crisis requires a mix of different research methods and synthesis of results across different methods. Research protocols and standard operating procedures can be developed and maintained now, in the cold phase, and will enhance the efficiency and validity of behavioural science deployment during a pandemic or crisis. The employment of various research methods that were not used (or used only to a limited extent) during the COVID-19 pandemic (e.g. co-design and intervention research) can further strengthen the validity and usability of behavioural science advice. Dialogue with decision-makers and policymakers facilitates the process of asking the right research questions and translating results into actionable advice.

- **A mix of research methods is necessary, according to interviewees.** An optimal mix of data collection methods consists of at least the following methods:
  - Literature review: at the uncertain beginning of the COVID-19 pandemic, review of existing literature was important to quickly gather relevant knowledge based on analogous situations from the past; as the crisis progressed, literature reviews were important to keep up with new behavioural science knowledge. In doing so, it became increasingly important to increase the capacity to conduct literature reviews as more and more was

[4] Kohatsu ND, Robinson JG, Torner JC. Evidence-based public health: an evolving concept. Am J Prev Med. 2004;27:417-21.
[5] Satterfield J, Spring B, Brownson R. Toward a transdisciplinary model of evidence-based practice. Milbank Q 2009;87:368-90.

published, including much research of lesser scientific quality, making proper filtering of literature of great importance.
    - Longitudinal cohort and trend studies: repeated and long-term measurement of trends and developments in society (as in the Netherlands with the six-weekly cohort study and three-weekly trend study) is seen in all countries as one of the most important forms of data for effective use of the behavioural sciences for the benefit of pandemic control.
    - Qualitative studies: focus groups and interviews (with citizens, but also with representatives of intermediary organisations) are seen as important for making sense of quantitative results and detecting side effects.
    - Experimental research and fieldwork: with this research, causal relationships can be demonstrated. Scenario studies contributed during the COVID-19 pandemic to making complex policy choices understandable to citizens, and making it clear to policymakers what public support would be for different policy options. Experimental research also helped illustrate the usefulness of the behavioural sciences to more medically oriented disciplines accustomed to experimental designs. Early deployment of experiments in Ireland ensured rapid impact and integration of the behavioural sciences.
    - Expert groups: setting up advisory and sounding board groups consisting of (mostly) external interdisciplinary scientific experts is seen as crucial in several countries. These expert groups helped conceptualise research questions during the COVID-19 pandemic, but also reflected on (the implications of) research findings and had a role in science communication to the public. These expert groups were mostly set up in early stages.
- **According to the interviewees, synthesis of research findings increases validity and reliability and allows policy advice to be given with more certainty.** This involves both synthesis of results from different research methods and synthesis of results from multiple similar studies. Applying synthesis across multiple studies is also a good way to properly weigh published research of lesser scientific quality in one's own advice.
- **The interviewees see interest in further developing (protocols for) innovative research methods during the current cold phase.** Several interviewees note that several promising research methods could not be effectively applied in during the COVID-19 pandemic. These methods have in common that they are innovative and not yet widely used. Effective deployment of these methods proved to require more time and manpower than was available during the warm phase of crisis response. Examples cited are:
    - Co-design of research with citizens from different target groups, including citizen science (e.g. the WUR Tick Radar) in which the public could have more confidence, was seen as very valuable and potentially impactful, but was only deployed on a very limited scale.
    - Different ways of picking up important social signals from the public domain early (e.g. through social forums, rapid ethnographic methods, or integration of the knowledge and expertise of "community champions") remained insufficiently developed. This means that important opportunities for early signalling and early intervention remained unexploited.
    - Limited intervention research has been conducted in most countries. Systematic and controlled research into the effect of different forms of behavioural support is necessary to determine what works. Attention should be paid to the fact that (groups of) people differ, and behavioural interventions therefore do not have the same effect on every group and in every context.

  - Integration of behavioural knowledge into infection and transmission modelling was seen as challenging because the behavioural sciences were often institutionally separate from medical advice. For example, in the Netherlands, it proved difficult to integrate behavioural science insights and variables relevant to the behavioural sciences into the modelling efforts of formal advisory bodies in a timely manner, or to model the effects of behavioural interventions themselves.
- **Being able to share research findings openly and freely is seen as highly desirable by interviewees.** This involves sharing findings with both the wider academic community as well as the public. This is desirable because of transparency (and its relationship with trust and support) and to allow as many people as possible to contribute to analysis and interpretation. Data sharing was complicated in all countries because of legal and (research) ethical challenges, e.g. around privacy/confidentiality and doubts about possible misuse of the data.
- **Continuous dialogue with decision-makers and policymakers is particularly necessary, according to the behavioural scientists interviewed, in order to ask the right research questions and match them with the right research methods.** In the chaotic phases of crisis response, there was often insufficient opportunity for such dialogue; interviewees from behavioural science teams experienced a lack of opportunities for dialogue with decision-makers and policymakers at the national level as well as with implementing agencies at the local level. Partly because of this, there was a tendency to get straight down to business as usual. As a result, research was also conducted that did not sufficiently meet the needs of decision-makers and policymakers.
- **Interviewees (both scientists and other profiles) experienced a lack of effective translation of scientific results into suggestions for policy and practice.** Several interviewees from different countries suggest that relevant knowledge may have gone unused because research results were not or were (made) actionable. Scientists generally receive little or no training in translating scientific findings into brief, non-technical and concrete advice that addresses the needs of policymakers and decision-makers. Lack of knowledge of the public health system among behavioural scientists also played a role during the COVID-19 pandemic.
- **Pre-developed ethical protocols and standard operating procedures for research can speed up the development and conduction of sound research during a pandemic or crisis**, according to the behavioural scientists interviewed. A lack of existing protocols was, in the experience of these interviewees, to some extent a reason for delay in the development and conduction of research during the COVID-19 pandemic, especially in the initial phase.
- **It is important to pay attention to finding a balance between quality and speed when giving policy advice during a crisis.** Several interviewees experienced a tension between quality and speed ("good enough") during their work in crisis advice. There was tension in several countries between the need for scientifically solid and valid research on the one hand and being able to deliver behavioural science advice quickly for policy purposes on the other. In some countries, this resulted in separate, "faster" behavioural science advisory structures within ministries, where translation of more scientific behavioural science results into policy was also facilitated. When these different behavioural science structures emerged, they often lacked proper coordination among

themselves. This caused doubt and concern among decision-makers around the quality and uniformity of behavioural experts.

2. Under which organisational conditions can behavioural sciences make an effective contribution to policy and management of pandemics and crises?

There was broad consensus that it is very difficult to assess the impact of behavioural science advice during the pandemic. Pre-existing relationships between behavioural scientists on the one hand, and policymakers and decision-makers on the other, were found to be very important for the extent to which behavioural science advice was considered and integrated. Behavioural science advice was more likely to be considered in the decision process if behavioural experts could explain the advice themselves during decision-making moments. Explicitly interdisciplinary advisory structures - with representation from the behavioural sciences - took policy advice to a higher level, according to the interviewees.

- **Measuring impact was perceived as difficult.** There was broad consensus among interviewees that it is very difficult to assess the impact of behavioural science advice during the pandemic. In general, a distinction was made between more instrumental aspects of behavioural science advice, such as around communication campaigns, where impact could be recognised and measured on technical and specific aspects. In contrast, more conceptual impact, such as on the conceptualisation and concretisation of a policy problem, was more difficult to recognise. Professional monitoring and evaluation systems to measure impact were lacking in all countries. Lack of feedback and transparency from policymakers and decision-makers on how behavioural science advice was received and what was done with behavioural science advice was also perceived as a major problem in all countries to identify the relevance and impact of behavioural science. Some interviewees pointed to the increasing degree of institutionalisation (e.g. establishing a sustainable behavioural unit or establishing a permanent place for behavioural science in a crisis counselling structure) as an alternative indicator of behavioural science impact.
- **Existing relationships are important to properly integrate behavioural sciences into policy decision-making processes according to interviewees.** During the COVID-19 pandemic, decision processes had to move quickly and there was limited room for consultation. On top of that, the situation was complex enough, and there was not always cognitive space left among policymakers and decision-makers for additional perspectives. As a result, those making decisions listened first and foremost to people with whom a professional relationship already existed. Pre-existing relationships and mutual trust between behavioural scientists on the one hand, and decision-makers and policymakers on the other, therefore became essential for giving advice. Relatively more relationships already seemed to exist in Ireland, which helped the integration of behavioural sciences. Without the right connections, identifying the right research questions, finding the right "language" to present results, and demonstrating the relevance of the behavioural sciences were perceived as more difficult. This was the case even when stakeholders were enthusiastic about the results.
- **Being present during decision-making moments is seen as essential by the behavioural scientists interviewed, to explicate given advice appropriately.** Being present is seen as the key to ensuring that behavioural science results are fully considered. When behavioural science advice was passed along in the form of a picture with an explanation by a policy official without behavioural science expertise, this often resulted in the meaning of the results

being lost and the advice therefore not being taken up. Interviewees saw it as crucial that behavioural experts could explain results directly at the table where the decision-makers sat. The extent to which (behavioural) scientists could give formal policy advice was also important: in the UK, for example, this was not sufficiently present, according to interviewees, because of a deliberate (politically driven) distinction between science and policy.

- **Explicitly interdisciplinary structures are considered important by all interviewees.** Interviewees (behavioural scientists as well as virologists/epidemiologists, policymakers, and communication professionals) saw interdisciplinary collaborations as an important way to arrive at informed, higher-level scientific advice, and to adequately translate behavioural science insights into the policy context. This importance was often understood only after interdisciplinary collaborations had been established. Medically oriented multidisciplinary advisory structures were central in all countries (e.g. OMT[6], SAGE, NPHET[7]), in some cases with behavioural science subgroups. Interaction between the behavioural science and medical disciplines was insufficiently present. The expectation sometimes seemed to be that behavioural science could be used mainly to communicate knowledge, not understanding that behavioural knowledge was already implicitly embedded in ostensibly medical policy choices. During the crisis, it was difficult for medical disciplines and structures to find time and openness to integrate disciplines that brought other perspectives.
- **Interdisciplinary and transparent communication to the public and professional stakeholders contributes to behavioural science impact, according to interviewees (both behavioural scientists and other profiles).** Many behavioural science structures used advisory boards of external scientific experts (usually professors) that were used, among other things, to interpret results for the public. In the UK, the interdisciplinary Independent-SAGE[8] was set up out of dissatisfaction with transparency of the formal advisory body SAGE, and Independent-SAGE became an important venue for public communication. Besides public communication, interpretation sessions for professional stakeholders were also regularly held in the Netherlands before results were made public to coordinate public communication.
- **More attention could be paid to the political context when formulating advice based on behavioural science knowledge according to interviewees (especially policymakers and communication professionals).** Several interviewees indicated that behavioural science insights were regularly not given in politically "convenient" ways. A concrete example of this is the experience that in political decision-making, giving "new" advice is sometimes important, and this led to repeatedly given (but not yet acted upon) behavioural science advice being ignored because there was a preference from politicians for new suggestions. The impact of the political context became particularly clear in situations where behavioural science evidence was politically inconvenient and thus received little attention (as in the UK).
- **The behavioural scientists interviewed indicate that a cultural shift around the communication and interpretation of uncertainty is needed to properly integrate behavioural science knowledge.** Behavioural experts are used to explicitly naming uncertainties and limitations of behavioural research. This sometimes contrasted with medical experts who generally gave their opinions

[6] Dutch Outbreak Management Team; see https://www.rivm.nl/en/coronavirus-covid-19/omt
[7] Irish National Public Health Emergency Team; see https://www.gov.ie/en/publication/de1c30-national-public-health-emergency-team-nphet-for-covid-19-governance-/
[8] See https://www.independentsage.org/

in more certain and technical terms that were more easily adopted by policymakers and decision-makers. Several interviewees experienced that this difference, especially at the beginning of the pandemic, contributed to doubts about the reliability of behavioural science research and limited recognition of the important role of behavioural science knowledge. Behavioural scientists can learn from the wording chosen by medical experts. At the same time, normalising uncertainties and limitations is valuable (as is also the case, for example, with election polls): absolute certainty does not exist and it is precisely important to be transparent about this.

3. How can behavioural science be organised (in the Netherlands and internationally) to be optimally deployed in sustainable advisory structures?

Behavioural science advice was generated along several routes (rapid-response behavioural teams within the government structure; independent scientific advisory committees; supporting behavioural teams or units at an independent (public health) institute; and external advice from a wider community of scientists and practitioners), but coordination between the different advice routes remained limited. A more central positioning of behavioural science in pandemic and crisis response would increase the effectiveness of behavioural science advice. For relevant behavioural science research of good quality, a sustainable behavioural science unit or department, with sufficient capacity, up-to-date knowledge, and opportunities for rapid scale-up during pandemic or crisis is important. International cooperation and support, both during warm phases of a crisis and during cold phases, was considered highly desirable.

- **Four different behavioural science advice "pathways" emerged from the research. Those interviewed consider more alignment and coordination between these routes as necessary for effective policy advice.** These pathways are recognisable to a greater or lesser extent for each specific country. In some countries, the routes were more hybrid (e.g. a combination of 1 & 2 in Ireland and the UK) or certain routes were missing (route 3 was missing in the UK, and also in Finland at the beginning of the pandemic). The routes were:
  1. Rapid response behavioural teams within the government structure. Particularly in the Netherlands and Finland, loose and usually small teams of behavioural advisers were hired or organised to quickly provide direct advice to decision-makers. An example is the Finnish Behavioural Policy Team at the Prime Minister's Office[9]. In the Netherlands, the DGSC-19 corona behavioural team was an example of this route. Interviewees mentioned that within this route, it was not always clear on the basis of which competences people were brought into these teams as behavioural experts, and what kind of expertise was needed for this.
  2. Independent scientific advisory committees that often consisted of external forces. Most countries had monodisciplinary structures that provided core advice to the government. Typically, a medically oriented core committee was central with no representation from the behavioural sciences in it (as, for example, the OMT in the Netherlands). In some countries (the UK and Ireland), this core medical advisory committee was supported by thematic subcommittees, including a behavioural science committee (such as SPI-B[10] in the UK). The actual degree of independence of these committees from the

[9] FINBEPOL; see https://vnk.fi/en/behavioural-science-activities
[10] Scientific Pandemic Insights Group on Behaviours; see https://www.gov.uk/government/groups/independent-scientific-pandemic-influenza-group-on-behaviours-spi-b

government varied from country to country. In the UK, dissatisfaction among scientists with government interference in SAGE led to the development of Independent-SAGE.

3. Supporting, often longer-standing teams or units at an independent (public health) institute. Examples of such teams or units are the Behavioural Research Unit at the Irish Economic and Social Research Institute[11], CUBE at the Finnish Institute of Health and Welfare[12] and the Behavioural Unit at the Dutch RIVM. These units usually have strong links with academic advisory boards. Getting access to policymakers and decision-makers, on the other hand, was not always perceived as easy.
4. External advice from a wider community of scientists and practitioners. Outside of formalized advisory structures, many behavioural experts weighed in by giving advice through the media, publishing and networking. Sometimes they are pulled into the other structures.

There was no or only limited coordination between the different behavioural science advisory routes in all countries. The coordination that existed was characterised by mostly loose, ad-hoc relationships. This was perceived as undesirable by interviewees; knowledge could not be pooled and policy questions were not systematically "tendered", but came in to different routes depending on the questioner and context.

- **The importance of independent and transparent behavioural science research should always be safeguarded according to interviewees.** During their work in policy advising during the COVID-19 pandemic, interviewed behavioural scientists sometimes experienced tension between independence and transparency on the one hand, and need for dialogue and translation into policy on the other. In the UK, the increase or institutionalisation of behavioural scientists within government (route 1) had the side effect of shutting out other routes (2-4), compromising the independence and quality of behavioural science research.
- **More central positioning of behavioural sciences in pandemic and crisis response was seen as crucial by several interviewees (both behavioural scientists and other profiles).** In all countries, it took a lot to get the behavioural sciences in the sights of decision-makers, policymakers, and even medical colleagues. Although the societal impact of pandemic policy amply illustrated the urgency of behavioural science advice, the status of behavioural science advice was not formalised. In all countries, it was stressed that after the COVID-19 pandemic ended, it was important to maintain momentum and further institutionalise behavioural science, as done in Finland and the Netherlands in particular.
- **Maintaining a sustainable behavioural science core with scale-up capabilities is seen as necessary.** All countries saw behavioural science capacity rapidly diminishing after the crisis was over, with the risk of loss of institutional memory and hard-won competencies and relationships. Training the next generation of behavioural scientists with experience within the crisis structure was also seen as a challenge; much acquired knowledge is lost over time. In countries where behavioural sciences were quickly used in crisis counselling by pre-existing structures (SAGE in UK, NPHET in Ireland), these structures also seem to scale down quickly again, with no clear core remaining to guard the sustainability of accumulated knowledge and structures. A sustainably

[11] See https://www.esri.ie/about-the-behavioural-research-unit
[12] Cultural, Behavioural and Media Insights Centre; see https://thl.fi/en/web/thlfi-en/about-us/organisation/departments-and-units/communications-and-influencing/cultural-behavioral-and-media-insights-centre-cube-

existing behavioural science core team, which keeps networks, protocols, processes and knowledge up to date and can quickly scale up if needed, was seen by interviewees (behavioural scientists as well as virologists/epidemiologists, policymakers, and communication professionals) as crucial to maintain accumulated knowledge and structures. A threat to such a behavioural science unit or department, seen by interviewees from all countries, is sharply declining funding for behavioural science research and advice.

- **The importance of sufficient capacity and budget was repeatedly stressed.** Rapid professionalisation of behavioural science, such as bringing in a programme manager, organising management back-ups, organising scientific external advisory boards, and fully compensating the time of behavioural experts drawn from within the crisis organisation was seen as very important by interviewees. An important factor was also the extent to which behavioural experts could take their own initiative in their advisory role, for example, by proactively formulating research questions that the research team, from their knowledge and earlier findings, expects to be relevant to pandemic control. In many countries, scientific advisers were inundated with a multitude of policy questions (not all of which were relevant), leaving insufficient space to put forward their own research questions.
- **International cooperation, support and recognition of the behavioural sciences was felt to be important.** International cooperation, both during warm phases of a crisis and during cold phases, was felt to be highly desirable. A concrete example is that each of the four countries conducted literature reviews during the COVID-19 pandemic to keep up with the fast-growing behavioural science literature around COVID-19. When each country does this individually, important capacity is lost; joining forces would be more efficient. Internationally organised support was seen as helpful, especially also to formally recognise the status and importance of behavioural science advice. One example is the WHO Action Framework for Behavioural and Cultural Insights, as it provides countries with concrete tools and support for demonstrating the importance of behavioural science and setting up behavioural science teams.

Authors*: Danny de Vries (DdV; University of Amsterdam), Marijn Stok (MS; Utrecht University, RIVM), Tess de Valk (TdV; RIVM), Marijn de Bruin (MdB; RIVM, Radboud University Medical Centre; also an interviewee in this research project)

**Roles in the research project:* Conceptualizing: MdB. Methodology: MdB, MS, DdV. Data collection and data analysis: DdV, MS, TdV. Writing: MS, DdV, TdV. Reviewing: MdB. Project administration: TdV, MS. Colene Zomer (RIVM) contributed to literatur review and data collection in the project's initial phase. To maintain independence of data analysis and interpretation of results, the following procedures were followed: a) an independent researcher from the University of Amsterdam was in the lead for data collection and data analysis; b) all interviewees were approached to provide feedback on the prefinal draft of this document; c) two external, independent senior researchers reviewed the document. An independent social science ethical committee has approved of the research.

Independent external reviewers: Will Tiemeier (Erasmus University Rotterdam, The Netherlands Scientific Council for Government Policy), Lars Tummers (Utrecht University)

Internal reviewers: Saskia Euser (RIVM), Floor Kroese (RIVM), Marie Claire de Vries (RIVM), Mariken Leurs (RIVM; also an interviewee in this research project)