
Executive Summary

Resilience: A central healthcare system responsibility and task

The SARS-CoV-2 pandemic, the war of aggression against Ukraine, floods, forest fires and heat waves as an outcome of climate change, supply chain disruptions and energy shortages: Rarely has Germany faced so many far-reaching crises at almost one and the same time. These and other challenges affect people's health and the provision of care. The pandemic has shone the spotlight on the strengths and weaknesses of our healthcare system, not least the poor utilisation of the opportunities that digitalisation brings.

In line with its legal mandate, the Council has analysed developments and trends in the German healthcare system and in its latest report places the focus on the system's resilience in times of crisis. The results of those analyses show that the self-perception often encountered before the above crises occurred – that Germany is well-organised and, thanks to a highly-differentiated emergency response and healthcare system, more than well-prepared to deal with unexpected events – has been and remains deceptive. Our healthcare system is both highly complex and fragile. In other words, we have a not really very responsive, not very adaptable “fair weather” system which – not only in times of crisis – is poorly coordinated and often performs worse than expected given the vast resources involved. Our healthcare system is not adequately prepared to cope with the outcomes either of climate change or those of pandemics. This is equally the case for other *known* crisis-related challenges – and no doubt even more so for *unknown* crises to come.

This cannot continue. Human health and human lives are at stake, as is the material basis of society, including values such as national and international solidarity, culture, science and education – all of which can only be upheld with the necessary finance and funding. To better manage crises in the future, our healthcare system, in fact our country, must be made more crisis-proof, meaning more resilient and structurally more robust. Because crisis-related challenges are by nature unpredictable, can sometimes occur simultaneously or in clusters and affect many areas of life, it pays to adopt an all-hazards approach. And given the fact that health is influenced by many other areas of life and thus policy sectors – such as the environment, labour, housing and urban development, transport, the economy and education – greater emphasis needs to be placed on the cross-sectoral “health in all policies” principle. This report looks at the challenges faced by our healthcare system, highlights the strengths and weaknesses revealed in the ways they are addressed, and sets out recommendations designed to enhance both system resilience and public preparedness, and enable us to better withstand the crises yet to come.

How the healthcare system copes with external shocks: Resilience as a guiding principle

Despite the occurrence of unforeseen events, **resilient systems** (see Section 1) continue to function in complex and challenging situations, ideally coming out of a crisis stronger than before. They are characterised by an ongoing process of reflective preparation, learning and adaptation in which knowledge from previous events is integrated into preparing for the challenges to be faced in the future. In this way, healthcare system

resilience is shaped by the interactions that take place between individuals, communities and organisations. In this report, the Council especially stresses the vital importance of **preventing and preparing** for foreseeable and unforeseeable crises or at least of mitigating the negative effects on people's lives and health, and on the ways in which society functions.

Healthcare system resilience is to be seen as an **ongoing process of preparation, learning and adaptation** in which, by means of preparedness and evaluation measures which are actually implemented, specific process owners and quality assurance bodies ensure that much-needed healthcare services can be maintained in both expected and unexpected crisis situations. When looked at from a systemic standpoint, this also involves promoting in "normal" times the research needed to prevent or mitigate the effects of ensuing crises, enable early detection of disruptive health-related events and identify the causes of illness and disease as quickly as possible – even under pressure.

Using the examples of climate change and the SARS-CoV-2 pandemic, the Council takes an in-depth look at two disruptive events which undeniably illustrate the substantial challenges to the resilience and robustness of the German healthcare system.

Climate change (see Section 2.1) harbours tremendous risks to human health. This is why the concept of planetary health must be made an integral part of the "health in all policies" approach and taken holistically into account. Direct outcomes of climate change include injuries, illness and deaths resulting from extreme weather events such as heat waves, torrential rain and tornadoes. In addition to effects which impact human health, and especially where vulnerable groups are concerned, a spectrum of risks (such as northward migration of traditionally "tropical" infectious diseases) must be considered and, accordingly, the relevant specialist disciplines and structures (e.g. care and emergency response services) redesigned.

When looked at from the **planetary health** perspective, regionally differing outcomes from climate change should no longer be seen from a purely local viewpoint, but rather in relation to potentially global effects – such as social outcomes and migration. The Council thus sees an urgent need to integrate the planetary health perspective into vocational, further and continuing education for the healthcare professions.

The SARS-CoV-2 **pandemic** posed a huge challenge for the German healthcare system (see Section 2.2). It had both a direct and an indirect effect on the system overall. Direct effects resulted, for example, in inpatient treatment for people infected with COVID-19. Indirect effects were highlighted by the infection prevention measures implemented, and also in changes made in the provision of standard care when elective surgery was rescheduled. In the longer term, pressures on the healthcare system could also increase due to the need to treat patients with long and post COVID (direct effect) and also due to the psychological disorders (for example, among children and adolescents) arising from the measures and restrictions that were put in place (indirect effect).

In many ways, the SARS-CoV-2 pandemic served as a **stress test for Germany's healthcare system**. When developing a resilience strategy, the knowledge gleaned from that situation must be fully taken into account without narrowing our focus on the pandemic itself. Rather, the task at hand is to develop strategies and approaches that enable an appropriate response to potentially different kinds of pandemics and to other types of crisis (such as extreme weather events).

A dedicated **resilience strategy** (see Section 3) for the healthcare system should focus on systemic resilience and take both social and economic considerations into account. An integrated resilience strategy thus accommodates the following phases of crisis: a) Preparatory phase, b) timely detection of the external shock, c) the impact of the shock and coping with it, and d) recovery and lessons learned. Good planning and preparation anticipates crises and averts them by means of targeted prevention measures implemented at the

earliest possible stage. A crisis-ready error culture, flexible reallocation of resources and short-term boosting of available capacities must all be planned, prepared for and practiced.

When developing a resilience strategy, it makes sense to avoid taking purely top-down approaches and instead to adopt a multi-stakeholder perspective which combines multiple standpoints, strengthens both peripheral responsibility and horizontal and vertical coordination, and aims to include social participation. The **preparatory phase** during non-crisis times is a key phase which enables timely implementation of prevention measures along with anticipation, early detection and management of potential crisis situations. Implementation of those preparedness measures must be subject to regular monitoring and review. Tried and tested approaches such as the Vision Zero models used in aviation, workplace and transportation safety should be used in conjunction with strict control measures backed up with sanctions and clearly-defined process owners' responsibilities and process roles.

Resilience-building crisis preparedness

Public crisis preparedness (see Section 4) includes a tailored governmental framework which should be put in place by means of early, holistic consideration of health-related aspects in legislative processes and decisions made by the various ministerial departments ("health in all policies" approach). In an international context, healthcare solidarity must increasingly be seen as the benchmark (global health). One key component of this kind of governmental framework is the clear assignment of responsibilities and roles to the different stakeholders. In addition, public awareness of the potential crises must be heightened and the basic understanding of how processes work in crisis situations underpinned.

In policy decisions made in all government ministries, health-related aspects must be taken into account. This requirement could be served by issuing **mandatory health policy statements** prior to reaching decisions which could impact human health. At federal level, those statements should be issued by the Federal Ministry of Health (BMG) and at Länder (state) level by the respective state ministries of health.

Civil protection and disaster response exercises should involve local and super-regional stakeholders, be conducted at regular intervals and the knowledge gleaned integrated into the various processes involved. With regard to the healthcare system, this must be planned and implemented as part of a cross-sectoral approach. It is equally imperative that the public health service be involved in that approach with newly-defined responsibilities, roles and tasks.

Irrespective of the kind of crisis faced, **digital support systems** are crucial. Both the relatively low level of awareness of the Nina Warning App and acceptance of the Corona Warn App exemplify the need for transparent civil communication, information and education in non-crisis times.

In matters of crisis preparedness, **international cooperation** should be expanded in non-crisis times as should exchange and collaboration in crisis situations. Where measures have already been implemented, further preparedness is needed – not least to enable joint procurement of vaccines and therapeutics should future health crises occur.

Not only does the **public health service** fulfil the functions of infection control that attracted so much attention during the SARS-CoV-2 pandemic, it also takes care of the population's health in many and diverse ways. However, even before the pandemic a number of deficits arose in the healthcare service which gradually worsened over time (see Section 5). Subject to local conditions, these include inadequate staffing and material resources, poor integration of public health service research in universities, the absence of a scientific society and the lack of coordinative components in the public health service's decentralised structure.

In Germany, applied public health research is in need of a new approach that is based on data and also collates and evaluates data with the aim of deriving empirically founded, targeted measures. To enable knowledge

transfer between practice, research and the public health service, flexible, translational structures are needed. There is thus an urgent need for close collaboration that takes place under clearly-defined conditions between the public health service, research, clinical care and private sector partners.

To be able to respond to people's needs at local level, the organisational structure of the public health service should remain decentral. But having said that, more interconnected central support for and coordination between decentralised actors is needed. The **planned Federal Institute for Public Health** should – in its capacity as a “national data institute” – be responsible for collecting, collating, providing, analysing and preparing data which is of relevance for the healthcare system. Other key areas of responsibility assigned to the new institute involve transparent, target group-appropriate communication and continuous quality promotion by means of, among other things, comprehensive benchmarking. In this way, the new institute could adopt the role of an interconnected player that thinks ahead in non-crisis times, collates various kinds of research findings and provides a platform on which to develop sustainable models for public health protection.

At municipal level, **greater differentiation in the range of responsibilities, roles and tasks** is recommended along with the creation of structural conditions for systematic and, where appropriate, cross-Länder establishment of joint, multi-municipality competence centres.

To enable the public health service to live up to its further-developed, broad range of responsibilities, its resources must be both **quantitatively and qualitatively improved**. If it is to fully perform its assigned tasks, not only does the service require more staff – it also requires needs-based, multi-professional composition of qualifications. Also, the potential for rapid scalability in the event of a crisis should be integrated institutionally, for example by establishing a volunteer pool. The service's digital infrastructure and especially its operability must also be improved to ensure smooth, cross-institutional exchange of information despite its decentral composition.

To ensure the public health service is a quality service, it must be **made more science based**. This calls, for example, for systematic dialogue and exchange between practice and science, the establishment of a scientific society and the inclusion of “public health” as a subject in university education.

An integrated resilience strategy also calls for improved **acute care** (see Section 6) which focuses on preparatory measures in non-crisis times. Currently, acute care in Germany appears redundant in many areas, is not very interconnected and is not (or is no longer) needs related. The existing structures must thus be adapted in a resource-sparing way so as to meet changing demand. Staffing and material resources must be able to be coordinated at short notice in such a way that healthcare supply is maintained and can be adapted to serve an acute need.

To strengthen structural resilience, many hospitals now providing primary care should be replaced by integrated **regional healthcare centres** which provide a modern, needs-related form of care. The range of services should be aligned to region-specific needs. This can include short-stay wards (general medical observation wards). By establishing regional healthcare centres, inpatient care days are reduced, thereby freeing up considerable staffing capacities for necessary inpatient stays.

Financing must also be adapted in line with resilient acute care structures. The current DRG-based remuneration system must be further developed to reduce misguided incentives. In particular, **equal remuneration** must be introduced for services provided in both inpatient and outpatient care. In this way, inpatient care days will be significantly reduced in the future, thus relieving the burden on inpatient staff. In light of the pandemic and the associated staff-related shortages in the availability of care, this measure is urgently needed.

To date, little attention has been paid to **sustainable allocation of staffing resources**, both in acute care and in other areas of care. The Council believes that inward migration of skilled workers from abroad can

only play a small role in ensuring needs-related staffing. Rather, the use of existing staff resources (for example by reducing over-use and misuse of resources) must be optimised for the longer term and working conditions improved. The task at hand includes promoting interprofessional teams and enhancing the status of healthcare professionals, not least by restructuring the allocation of responsibilities and promoting higher education for nursing staff.

Older, multimorbid patients in need of long-term care were and still are especially at risk in the SARS-CoV-2 pandemic and from the outcomes of climate change, especially heat waves. The pandemic revealed a wide range of problems and shortfalls in long-term care. While for the most part, these are not necessarily new, they have received neither the attention nor the recognition they deserve. The structural deficits in long-term care must be countered in efforts to improve resilience in the provision of **long-term care** in its various settings and among the different groups providing care (see Section 7).

Decisions on measures for pandemic control in long-term care call for reliable, **empirically-founded efficacy and safety of preventive and therapeutic practices**. Longitudinal studies must be initiated in all settings involved in long-term care. If acute crises are to be managed and overcome, and longer-term processes of learning and adaptation enabled, systematic surveys, registers and cohort studies must be commenced. Chains of infection must be understood and the courses and outcomes of disease documented, both for people in need of care and for those providing care.

Placing greater focus on **quality regulation and control** can effectively prevent care providers from giving top priority to one-sided profit orientation while pushing issues such as fair pay and appropriate, needs-related staffing and reinvestment in care institutions aside.

There is a need for specified **further development of medical abilities and skills** for specific skilled care professionals working in long-term care and the implementation of specific care approaches on the basis of a general law governing healthcare professions. To improve the status of the nursing profession and ensure carers' perspectives are better taken into account, an **effective professional self-governing body** must be established whose composition reflects all levels of nursing training and qualification.

To improve **the capacity of family caregivers**, mid-term and long-term options for financial support must be expanded and arrangements concerning working hours and place of work made more flexible. No-one should be excluded from exercising their legal entitlement to provisions concerning care time and end-of-life care. **Forms of housing and care** must be further developed with the aim of maintaining the independence of people in need of long-term care and of ensuring their safety. This would not least improve the available alternatives to live-in care. Working conditions must also be urgently improved for what are in most cases migrant 24-hour carers, with legal certainty ensured for all parties.

For the healthcare system to function as it should, an adequate supply of medicines, medical products, protective equipment and similar resources is essential. In times of crisis, a resilient healthcare system should be able to compensate for temporary shortfalls in supply and cover increased or special demand at short notice. This includes not only strategies to stabilise or bypass global **supply chains**, but stocking up on much-needed products and ensuring production capacities are secure (see Section 8).

Better monitoring, an at least partially regional procurement process and greater global cooperation would help in exploiting the benefits of global trade without the inherent risks of global supply chains putting supply security at risk. To mitigate dependencies in the procurement of crucial health supplies and their upstream products, **strategies to make supply chains more resilient and robust** must be put in place – among them multiple sourcing, nearshoring and global diversification. For medicines, this could be done by issuing tenders for discount contracts containing corresponding clauses and, in addition, be regulated by means of mandatory stockpiling provisions. Regional production capacities required for products that are both vital for human life and crucial to crisis management but which are not suited to stockpiling per se must

also be secured to ensure demand can be met with the necessary speed in a crisis. Hybrid systems should be utilised which combine the benefits of capacity payments with those of performance incentives.

In addition to existing legal provisions, **adequate stocks** should be secured by means of binding specifications which are subject to sanctions. A decentral stockpiling approach is to be favoured over central management as greater involvement of suppliers and distributors incentivises and facilitates efficient stock rotation. A portion of payment and suppliers' operating licences should be coupled to compliance with stockpiling provisions. Also of importance is detailed documentation along with regular, unannounced, random "on-site" stockpile inspections.

In efforts to boost innovative power, in addition to measures to improve Germany's research landscape, **reliable patent protection** is needed to ensure that in the future, ways and means to combat a crisis can be found without delay. It must also be recognised that combatting a global crisis can only really be successful when cooperation is also sought with countries that are unable to pay monopoly prices. This is where **international solidarity** is called for – not least on grounds of enlightened self-interest.

Crisis management

In times of crisis, **decisions** must often be made quickly despite the **uncertainties** that abound and these can have far-reaching, even disastrous consequences for individuals and society overall. On the part of decision-makers, this can lead to behaviourally misguided incentives such as herd behaviour and path dependencies. The measures taken can lead to **under** and also **over supply** of medical services and care. **Implementation, monitoring and control of the measures adopted** largely depend on their acceptance within the population. Trust in government, perceptions of personal risk and a sense of responsibility for others foster adherence to the measures that are put in place (see Section 9).

Transparently structured processes reduce decision-making errors and can strengthen people's trust and acceptance. This is where **decision-making processes** which have been evaluated in advance can help.

To anticipate trends as a crisis develops and unfolds, the Council recommends ensuring rapid, scientifically-validated information gathering and assessment using interdisciplinary **crisis management teams and expert panels**.

Vertical **communication and cooperation** between the federal and Länder governments and local authorities should be intensified by boosting capacities within the Federal Office of Civil Protection and Disaster Assistance (BBK). Political decision-making processes must also consult and consider local-level expertise in the crisis region. Where the measures implemented differ from region to region, these must be justified in a transparent way and systematic dialogue and exchange must take place between the regions concerned, thereby improving horizontal communication to enable timely and effective measures to be identified, developed and enhanced.

Sections of the population affected by **over, under and inappropriate healthcare supply** should be identified in a timely manner and considered in all crisis management plans. For example, the strikingly high mortality rates among patients who were ventilated using extracorporeal membrane oxygenation (ECMO) in the first three waves of the pandemic are a compelling reason to correct the diagnosis-related groups (DRG) remuneration system with regard to misaligned incentives in the remuneration of ventilation procedures.

In-depth **policy advice and consultation** involves obtaining findings and assessments from differing sources and thus taking different kinds of knowledge into account – not least knowledge that is evidence based, experience based, theoretical and context related. To prevent and overcome a crisis, complex interventions are needed which must be continuously evaluated and reviewed. But in addition to the target-related effectiveness of measures adopted, the extent of their unintended outcomes must also be explored. This means taking full

account of the specific context, the perspectives of the various stakeholders, the costs associated with implementation and the social outcomes of the measures involved (see Section 10).

When dealing with a crisis, priority should be given to addressing those questions of direct relevance to decision-makers, healthcare practitioners and affected individuals, rather than turning first to those that can be answered with greater certainty and scientific accuracy. A correspondingly practice-focused “research agenda” should be supported by incentives and funding structures.

There is also a need for quickly available **financial assistance for relevant research which can be planned for over the longer term** – where appropriate also deliberately providing for freedom away from conventional, often rigid funding formats, as both staffing and financial resources in research institutions are primarily tied to existing and thus competing research activities. In particular and as a matter of urgency, funding for translational clinical research and development conducted in Germany must be raised to an internationally competitive level.

To ensure that all research is needs-focused and its results actually flow into policy decisions, **scientists and scholars must be offered incentives**, such as reduced teaching commitments for those who engage in scientific policy advice and consultation.

This means consolidating **all relevant disciplines** (including the social, behavioural and communication sciences) to gain a full picture of the potential risks, effects, strategies and solutions. Expert councils should thus be multidisciplinary in their composition.

The Council has repeatedly defined the goals and objectives of and the conditions needed to enable a **dynamically learning healthcare system**. The prerequisites for this – particularly in a crisis – are timely use of healthcare supply data and its collation with other relevant information (record linkage). One of things the Council recommended in its 2021 report was the creation of a law on health data use.

Objective, fact-based, strategically planned communication is a fundamental crisis management tool which can be used to significantly heighten both awareness and understanding of a risk situation, and the acceptance of recommended (or mandatory) prevention measures (see Section 11). To date, Germany lacks a centrally responsible institution which generates and researches, consolidates and interprets, evaluates and classifies the knowledge needed in times of crisis, and then translates it into a clearly-structured communication and information strategy.

To foster civil trust and engagement and enable informed decisions, strategies and criteria for **transparent healthcare communications** must be pursued. First and foremost this includes communicating risks, setting out the advantages and disadvantages of a given measure in a transparent way, using language that can be understood by different sections of the population, justifying and supporting arguments with facts, and explaining how uncertainties and knowledge gaps are a part of knowledge production in an ongoing process of dialogue and exchange.

For certain target groups (such as those with lower socioeconomic status or poor health literacy) **outreach education and information strategies** are needed. For example, health kiosks serve as suitable touch points for vulnerable groups.

By means of regular analyses outsourced to an external institution (e.g. IQWiG), sources of and content contained in **fake information** must be identified and political and legal measures used to effectively counter its further dissemination by lifting the anonymity of sources in certain cases, ensuring compliance with media law standards and holding those responsible liable and to account where violations occur.

The various ways of strengthening resilience as set out above are all fully incorporated into resilience-building strategies and approaches. The concepts of the “heat wave” and “infectious disease” crises chosen by the Council as examples for this report take in the aspects set out below (see Section 12).

Unlike Germany, other countries in Europe have already introduced regular monitoring of morbidity and mortality rates in relation to weather data, especially where **heat waves** are concerned. Such monitoring forms the basis in preparing heat wave action plans, which in Germany are not yet sufficiently established or embedded in law. Especially vulnerable people can rarely be reached in a targeted way. There is a lack of publicly accessible cool places and of models for targeted relief in inpatient care.

The healthcare system also plays a role in resource use and in climate change. Through the introduction of environmentally-friendly climate control measures, its institutions must be made (more) climate neutral and better able to cope with the outcomes of extreme heat events.

Monitoring and surveillance systems should be developed, installed, continuously used and evaluated before a crisis occurs to foster preparedness to cope with external shocks and crises such as heat waves. Having such systems in place makes it easier to deploy them without delay in an acute crisis and can also be used to detect impending risks at an early stage.

When planning **preventive measures**, especially vulnerable groups must be considered, both in terms of providing the necessary resources and, where applicable, establishing direct contact with them. This could be done by involving and strengthening the public health service, and could fall within the remit of community health nurses or (general) medical practice teams.

Implementation of heat protection measures should be made mandatory by means of **federal-level framework legislation**. In addition to acute measures set out in heat action plans, medium-term measures – such as the inclusion of heat protection in urban and building planning – are also advisable. Here, differing perspectives must be considered in order to assess the necessity, planning and practical implementation of preventive measures, which in turn calls for interdisciplinary, structured and overarching collaboration between the various actors and levels. This is to be promoted by means of improved communication and a structured evaluation process.

Also, heat waves must be countered to an even greater extent by means of effective climate action. The Council thus recommends supporting projects and measures aimed at **reducing the environmental footprint**, including in the healthcare system. Carbon emission inventories must be conducted for specific areas without delay to enable measures to be implemented efficiently and effectively, and to monitor their effects.

A monitoring and surveillance system established in non-crisis times which looks at real-time data is also needed with a view to crises arising from the spread of **infectious diseases**, as seen in the SARS-CoV-2 pandemic, thereby enabling their detection and the assessment of associated risks, their monitoring and ultimately their treatment.

In Germany, specialised interdisciplinary research centres are needed which are active in non-pandemic times so as to drive diagnostics and the development of treatments and vaccines, and in doing so combine basic research with clinical and healthcare research. Development of treatments in academic centres and cooperation between those centres and private sector research must be better promoted. Implementation of agreed research programmes in the event of a crisis must be greatly accelerated. Ideally, pandemic plans should be prepared for specific pathogens (all-hazards approach) and the possibilities of differing transmission paths taken into account, with secondary effects and psychosocial challenges also being considered.

Both in Germany and worldwide, the risk of the occurrence of disruptive events is rising. Strengthening resilience in the German healthcare system thus poses a complex and challenging task which we must urgently address. The aim is not just to maintain the status quo, but ideally to come out of crisis situations stronger than before so that building resilient structures is not only seen as a task that requires tremendous effort, but one that – above all else – provides a chance.