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Towards Integrated Pandemic and Disaster Management

Approaches in Armenia and Germany

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Abstract

This report seeks to establish a working definition of the term *integrated management* with regard to crisis and disasters which can then be applied in a mapping exercise to determine the presence of integrated management in pandemic preparedness and response plans and legislation in Germany and Armenia. Different approaches in the use of the term across disciplines, ranging from disaster risk reduction to education, have been reviewed, resulting in the identification of several structural aspects, leading principles and objectives that are common across the selected fields, and leading to the formulation of a working definition of the term. The aspects, principles and objectives have been mapped in a selection of publicly accessible plans and legislation relevant to the current pandemic situation in both countries. Key findings include that the terminology in preparedness and response plans as in legislation, is not reflective of integrative approaches, however tendencies towards integrative approaches are discernible. Gradual processes of integrated preparedness and responses might be taking place *downstream*, i.e., in and between institutions and organisations. All findings, though this one in particular, led to the recommendation to study the presence of integrated management in preparedness and response plans and legislation further, including the review of operational plans at national and subnational levels, and within and between organisations involved in preparedness and response activities in the respective countries (e.g., Red Cross-National Societies, UN agencies etc.). Key informant interviews and after-action reviews may be suitable tools to enrich the findings of future research.

Keywords: integrated management, pandemic management, disaster risk management, cross-sectional issues, multiple hazard approach, people-centred approach, spatial and temporal characteristics, effectiveness and efficiency, prevention, resilience, health and risk policies

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Acronyms

ADRU ..... Academy Disaster Research Unit
AKFS ..... Akademie der Katastrophenforschungsstelle
CCA ..... Climate Change Adaptation
DRM ..... Disaster Risk Management
DRR ..... Disaster Risk Reduction
GFDRR ..... Global Facility for Disaster Risk Reduction and Recovery
HiAP ..... Health in All Policies
iDRM ..... Integrated Disaster Risk Management
IDSR ..... Integrated Disease Surveillance and Response
KFS ..... Katastrophenforschungsstelle
NGO ..... Non-Governmental Organisation
NHS ..... National Health System
PC-MH ..... Patient-Centred Medical Home
S&OP ..... Sales and operation planning processes
SDG ..... Sustainable Development Goals
UN United Nations
UNICEF ..... United Nations International Children's Emergency Fund
WHO ..... World Health Organization

Executive summary

In this report on integrated pandemic and disaster management, the authors attempt to extract a working definition for *integrated management* by analysing the term's use in disaster risk reduction, health, humanitarian aid, and the business and education sectors. The aim is to develop an encompassing, systemic understanding of integrated management which addresses the complexity of related effects if disasters and crisis such as a pandemic. In a second step, a mapping exercise is undertaken to identify existing integrated management approaches in pandemic preparedness and response plans and legislation in Armenia and Germany.

In its most basic understanding, integrated management an act or process of *combining two or more things so that they work together* (2020 Oxford University Press). In the attempt to understand the applied usage of the term *integrated management* in various fields, the report summarises the findings of an extensive literature review. The literature review, conducted with focus on disaster risk reduction and health sector literature and complemented by humanitarian aid, business, and education sector perspectives, identified eight different aspects that were common across all documents considered in this report. The commonalities can be grouped into three structural aspects, four general principles and two objectives. These are:

Structural aspects	General principles	Objectives
• Harmonisation of information/ knowledge management and policy making. • Internal integration • External integration	• Mainstreaming cross-sectional issues • Multiple-hazard approach • People-centred approach • Consideration of spatial and temporal characteristics	• Improved effectiveness with strong intent to improve prevention and resilience • Improved efficiency/ optimised usage of resources

Based on these commonalities the authors suggest the following definition:

Integrated management of crises and disasters (IMCD) refers to a complex and dynamic societal process in which all aspects perceived as relevant by horizontally and vertically as well as internally and externally cooperating actors are understood in their context and corresponding effective and efficient measures are taken in a coordinated manner by all relevant actors to prevent crises or disasters and, in case of their occurrence, to avert harm and ensure the well-being of the people at risk under dynamically changing conditions.

In a second step, a select number of Armenian and German pandemic response plans and legislature was reviewed for the presence of the identified structural aspects, general principals, and objectives. Findings from the mapping exercise include:

- The terms integration/integrated management themselves are partially or fully absent in most documents. Instead, relatively frequent reference is made to coordination and/or collaboration, indicating a tendency towards integrated management without this being explicit.

- Some documents state that stakeholders *will be working together* on specific areas or subjects while falling short of explicitly outlining *how* this will be done. It must thus be assumed that the actual manifestation (planning documents, working agreements, division of responsibilities/labour) of how to manage the complex, dynamic socio-technical processes of integrated preparedness and response to disasters takes place at the operational and (inter-)organisational level – if at all.
- Both countries (Germany and Armenia) updated pre-existing key preparedness and response plans in 2020, indicating that neither country was prepared to fully meet the demands of a public health emergency of the scale of the SARS-CoV-2 pandemic – despite health experts around the world having issued respective warnings for many years.
- Not all documents lend themselves in their structure and intent to the mapping of any or all structural aspects, leading principles, and key objectives.

In conclusion, the authors find confirmation of a statement made by the WHO in 2009 that in mapping the presence of integration in pandemic preparedness and response plans and legislation, there is no 'yes or no' answer to the question whether a plan or legislation is laid out in an integrated approach (WHO 2008 continuum of integration). None of the mapped documents fit the proposed definition of integrated crisis and disaster management, and even a very loose interpretation of an integrated approach is difficult to discern. However, collaboration and coordination, both vertical and horizontal, are core elements in most of the documents and *invite the suspicion* that there is factual integration taking place at operational and organisational level.

Gradual processes of integrated preparedness and responses might be taking place *downstream*, i.e., in and between institutions and organisations, with anything from *loosely* coordinating activities *occasionally* between different sectors or divisions, to rooting integration at the core of the planning process all the way through seamless implementation of a multi-sectoral, multi-hierarchical implementation being conceivable. Also, various configurations of integrated (pandemic) management might appear, depending on local circumstances.

It must be noted (and in fact is referenced by several studies and authors reviewed in this document) that the theoretical inclusion of any concept on paper is an important step in the process towards its practical implementation. However, the actual implementation may pose challenges and issues unforeseen in the theoretical approach. Further research is needed to assess the presence of integrated management of crisis and disasters in preparedness and response plans at operational levels (i.e., in and between organisational, ministerial, national, regional, and local levels), for instance through after-action reviews, lessons learned exercises and key stakeholder interviews.

This report is to be understood as an explorative endeavour and not a comprehensive assessment. Several limitations impacted on the comprehensiveness of this working paper including access to operational documents and to full versions of some legislative documents from Armenia, and the quality of publicly accessible English translations. This report is intended as baseline for a future, more in-depth analysis.

1. Introduction

The pandemic outbreak of SARS-CoV-2 challenges the world's nations on multiple levels. The spread of the virus has dominated global developments since. In December 2019, a first case of the new respiratory disease COVID-19 was recorded in Wuhan Province (World Health Organization 2020). Shortly after the virus rapidly spilled over to other continents. On 30th January 2020, although numbers of confirmed infections outside of China were still low, the Director-General of the World Health Organization (WHO) – based on the recommendation of the International Health Regulations Emergency Committee[1] - declared the novel coronavirus outbreak a public health emergency of international concern (PHEIC), WHO's highest level of alarm. On 11th March 2020 WHO announced the outbreak to be a pandemic, i.e. the worldwide spread of a new disease (Tedros 2020).

The rapid spread of the disease across countries and within societies, at a time when little was known on an operational level about prevention and control, led to a myriad of responses at regional, national, and subnational levels across the globe. It soon transpired that some countries were better prepared for the situation than others and were willing and able to implement drastic measures to control the outbreak locally and nationally. Other nations have had geographical advantages and were able to take quick steps to control entry points and thus halt the import of new infections. Taiwan, for example, has learned a hard lesson from previous Coronavirus outbreaks, and in consequence had overhauled its pandemic preparedness and response plan towards a collaborative whole-society approach (Schwartz und Yen 2017). However, even countries who managed the outbreak with comprehensive measures from the outset faced a resurgence of cases and difficulties in containing local outbreaks („WHO Coronavirus Disease (COVID-19) Dashboard“ 2020).

The development of national, regional, and global response strategies to the pandemic, their communication and implementation as well as the management of multiple downstream effects requires the cooperation of many stakeholders, among them clinical and public health experts, scientists, administrations, politicians, and civilians. Responsibilities begin with information and communication influencing individual behaviour, supported by local and subnational regulations, steered by national guidelines and policies, and ideally embedded in regional frameworks – all of which are informed by the recommendations of national centres for disease control and international organisations such as the WHO. For months, the scale of the emergency has rendered it the sole public health concern for many Nations, and has unveiled stark consequences for national, regional, and global economics, and societal impacts that continue to affect the world's population to varying degrees. Based on this experience, it has become more evident than ever that the spread of a disease and measures to recuperate from its multi-layered impact requires recognition, understanding, evaluation, and management in an *integrated* and *systemic* approach, addressing the pandemic comprehensively as a complex, social phenomena with varying and concurring objectives across multiple sectors and cultural spheres. In a highly interconnected, culturally diverse, and globalised world, a systemic, integrated approach is needed to

[1] The IHR Emergency Committee is made up of international experts who provide technical advice to the WHO Director-General in the context of a "public health emergency of international concern" (PHEIC). Under the IHR (2005), Temporary Recommendations automatically expire three months after their issuance. Emergency Committees are therefore reconvened at least every 3 months to review the current epidemiological situation and to review whether the event continues to be a public health emergency of international concern and whether changes need to be made to the Temporary Recommendations.

develop joint strategies to contain complex crisis and disasters as, for instance, the SARS-CoV-2 pandemic.

Part one of this report establishes the conceptual approximation to the term "integrated management" with regard to crisis and disasters, resulting in the drafting of a working definition. Part two provides a short empirical analysis of the mapping of integrated management in publicly accessible preparedness and response plans in Armenia and in Germany, as further explained below. The explorative analysis does not intend for any form of comparison between the two countries' approaches to integrated management but aims to establish a baseline understanding of the concept in each country.

The overall aim is to develop an understanding of the term *integrated management* with regard to crisis and disasters and to map the degree to which authorities, institutions, systems, and societies are operating in an integrated, systemic approach, in order to optimise the crisis and disaster, preparedness and response, discussed here using the Sars-CoV-2-Pandemic as an example.

For this purpose, a working definition and core aspects of integrated management are formulated and visualised in a framework diagram of integrated management with regard to crisis and disasters. Based on these aspects, publicly accessible preparedness and response plans (at national and/or state level) in Germany and Armenia are mapped and analysed for their integrated, systemic approaches. It must be noted (and in fact is referenced by several studies and authors reviewed in this document) that the theoretical inclusion of any concept on paper is an important step in the process towards its practical implementation. However, the actual implementation may pose challenges and issues unforeseen in the theoretical approach. Research which extends beyond this report is thus needed in order to analyse the practical processes and cooperation in comparison with the existing frameworks.

Component 1

- Overview of key aspects (structural aspects, leading principles, and objectives) of integrated management of crisis and disasters and eliciting a working definition of the term itself, through the provision of a short overview of several different interpretations of the term integration and respective core aspects and extracting commonalities between the different interpretations.
- Visualisation in a frame diagram of integrated (pandemic) management.
- Short empirical analysis of key findings from the mapping exercise in Component 2.

Component 2

- Mapping of existing approaches to integrated management, between institutions and departments, guided by preparedness and response plans and steered through legislation in Germany and Armenia, through the review of existing pandemic preparedness and response plans and other relevant documentation in Armenia and Germany for their approach to the systematic and integrated management of pandemic as an example.

2. Review of different perspectives on integration across fields

2.1 Methodology

The term "integrated management" is widely used in the context of this pandemic, as in other crises, emergencies, and disasters. It appears in may contexts, among them that of the organisation of health care (Mavhu 2020), in the context of cooperation among scientists (Moradian u. a. 2020), in sector-specific contexts such as "water management and transboundary water cooperation"(UNECE 2020) and in the context of building back better after a disaster and to preventing future crises (UNDP 2020). Beyond the current context, the term integrated management is used widely in various sectors from business management to education systems. While defined by the Oxford dictionary as "the act or process of combining two or more things so that they work together" (2020 Oxford University Press), the various interpretations of the term cover a variety of meanings, making it exceedingly difficult to argue with certainty that its use in emergency and crisis preparedness and response is based on a common understanding.

To arrive at an agreeable understanding of the term *integrated management* and to conduct the mapping of existing integrated approaches in pandemic prevention, preparedness and response strategies, a range of perspectives on its use are examined in this document. The authors focus on the most closely related perspective of *Disaster Risk Reduction,* and the *Health Care perspective,* and evaluate them through an extensive literature review. The overall objective is to develop an encompassing, systemic understanding of integrated management of crisis and disasters taking the example of a pandemic as a complex crisis, firstly to address the complexity of related effects and secondly, as the term is widely used in many different contexts whereas an overall conceptual understanding yet is missing. To this end, the authors assess the understanding and use of the concept of integration from humanitarian aid, education, and business perspectives. To arrive at a comprehensive working definition based on the state of the art, the authors proceed in three steps:

1) Selection of the perspectives

Perspectives included in this report were selected on a rolling basis and on account of their relative relevance to pandemic management starting from the most obvious, health, disaster risk reduction (DRR) and humanitarian aid; to closely related areas of education and business management. The selection of the perspectives covered in this report relied on a non-systematic literature review of the usage of the terms *integration and integrated management.* The DRR and the Health Care perspectives were processed in more detail until, according to the assessment of the authors, a saturation is reached. The three further perspectives (humanitarian aid, business, and education) were additionally evaluated, however not in as much detail as the first two. The authors used Pubmed, Primo, Google and Google-Scholar for their literature search.

2) Examination of sectoral perspectives

In a second step, the use of the terms *integration and integrated management* in each sectoral perspective was examined. Again, relying on a non-systematic literature review the authors collected different explanations and definitions of the term present in each sector. Subsequently, the authors

summarised the general objectives of integrated work in each sector and extracted common aspects across the selected sources. Commonalities are displayed in a table.

3) Extracting commonalities across all perspectives

Lastly, the authors examined all sectoral perspectives covered in this report regarding their overall commonalities. The intention thereby is to extract aspects which are repeatedly utilised in the different sectors, and therefore seem to represent the core aspects of integrated management. Consequently, the authors' working definition of *integrated management of complex crisis and disasters* is based on these core aspects.

The following chapters outline the various perspectives and uses of the term integration in the above outlined sectors.

2.2 Integration: The Disaster Risk Reduction perspective

In a historical analysis, Serra-Llobet et al. (2013) have outlined how disaster risk reduction (DRR) activities developed since the 1980s. They noted an increase **in vertical and horizontal communication** across different institutions and a growth in organisational complexity, with a **transfer of lessons-learned from one disaster to other scenarios** beginning to take place (Serra-Llobet, Tàbara, und Sauri 2013).

Gopalakrishnan and Okada (2007) describe integrated disaster risk management (iDRM) as a "powerful disaster management tool" (p. 354), which aims to significantly improve a community's security and thus the quality of life of the people. At the basis of iDRM stands a comprehensive analysis of disaster risk, considering all human and economic losses and the distribution of these losses. Through the process, **different stakeholders and values should be taken into account**. The focus lies on the **reduction of vulnerability and a proactive strategy,** so that that the burden of future hazards is shared and mitigated. However, the authors notice a gap between the theory of iDRM and its realisation in practice due to institutions that hinder the implementation. Institutions are defined by the authors as "a wide spectrum of entities that have a direct or indirect bearing on disaster risk management and mitigation" (p. 356). They identified three principal components of institutions: "a) preparedness/warning, reconstruction/rehabilitation, and disaster mitigation agencies; b) disaster-related laws, regulations and statutes; and c) culture, tradition and customs" (ibid). In their analysis, they outlined 8 key aspects of institutions that are necessary for the effective implementation of iDRM (Gopalakrishnan und Okada 2007):

- **awareness/access** – referring to the timely accessibility of reliable information to all relevant stakeholders.
- **autonomy** – referring to the ability of agencies to take autonomous decisions in case of a disaster when time is short.
- **affordability** – referring to the fact that any mitigating measure must be affordable for the affected parties.
- **accountability** – referring to the need of responsible acting of stakeholders.
- **adaptability** – referring to the capability of measures to be adapted to different cultural context and local conditions.

- **efficiency** – referring to the aim to avoid duplication of responsibility and jurisdictional overlap.
- **equity** – referring to the necessity to consider equity during all measures.
- **sustainability** – referring to the demand on implemented measures to also be usable and applicable in future.

The authors propose several approaches to realising these aspects (Gopalakrishnan und Okada 2007): 1) institutional integration, meaning the **cooperation between stakeholders, horizontally and vertically,** based on broad participation also of local stakeholders in decision making; 2) public-private partnerships also involving private agencies and insurances into disaster risk management. An **effective information management and sharing process across all sectors**; 3) a broad public participation encompassing NGOs, citizen initiatives, private agencies, etc.; 4) the revamp of current legislations and laws regarding DRM. Lastly, they point out that "to be effective, disaster management policy must acknowledge the **interconnection between nature and culture as well as their mutual conditionality**" (p. 369).

In all actions, the fact that societies adapt continuously and constitute a complex system should be recognised: "an effective disaster management policy must be predicated on the assumption that outcomes are not always predictable and there is often room for surprises. Nevertheless, through a process of dialogue involving multiple stakeholders, the area of uncertainty can be substantially reduced" (Gopalakrishnan und Okada 2007, 367).

Shi et al. (2007) provide an insight into integrated disaster management in China. The goal of the Chinese integrated disaster management is to "realize the **horizontal harmonization** to the margin without dead angle and the **vertical harmonization** to the end without blank" (Shi u. a. 2). Vertical harmonisation refers to the improved cooperation of governments at different levels. Horizontal harmonisation describes the cooperation between different sectors at one level. Lastly, at the basis of horizontal and vertical integration, institutional integration is needed. This entails the harmonisation of different policies, laws and regulations related to disaster risk reduction (Shi u. a. 2007). Above all stands the principle of "giv[ing] priority to disaster prevention, and combin[ing] disaster prevention with disaster resistance and relief"(Shi u. a. 2007, 2). The Chinese approach has been taken further, as outlined in the article from Jiang (2013 101): "China integrates disaster prevention and reduction work into its overall governance structure; builds capacity mainly in cross-agency collaboration and cross-regional cooperation on multi-hazard comprehensive prevention and reduction; plans holistically measures against natural disasters as well as all stages of disaster prevention and reduction; leverages resources from all sides and integrates multiple tools such as laws, regulations, market, and technology; and strives to reduce life and property losses." He outlines that China has succeeded in moving from a single- to a multi-hazard approach, in including disaster reduction work, and shifting from a disaster mitigation approach to risk reduction (Jiang 2013).

Ikeda et al. (2008) discuss the context of Japan in an article with the topic: *integrated framework for disaster risk management.* Their view comprises several aspects: (1) integration of **different categories of risk reduction options** in terms of structural [hardware of hazard control facilities] and non-structural measures [software as early warning or insurance scheme], regulation and market-oriented measures, (2) **strengthening of the capacity of local communities** to make their own management choices (…) and (3) promoting the **participation of stakeholders throughout the entire cycle of risk management**" (Ikeda, Sato, und Fukuzono 2008, 268).

Birkmann and Teichmann (2010) evaluated the status of the collaboration between Disaster Risk Reduction (DRR) and Climate Change Adaption (CCA). In their report, they group the existing difficulties

of practical collaboration in three groups: 1) scale mismatches; 2) mismatches regarding norms; and 3) knowledge mismatches. The first group encompasses the **spatial, the temporal and the functional scales** (Birkmann und von Teichman 2010). Climate change scientists often work on a global scale, whereas DRR takes place with a close relation to local circumstances. For effective DRR in local climate change adaption, further information on the local impact of the climate change would be needed (Birkmann und von Teichman 2010, 5). In practice, Disaster Risk Reduction activities are, according to the review, often focused on short-term help. The opportunity of long-term interventions is often missed. Climate change adaption, however, requires a long-term approach which also includes the possible negative effects of current adaption activities (for instance, a fan may improve temperature adaption now, but will increase global warming due to increased energy use). Mismatches on the functional scale occur when the distribution of responsibilities hinders the collaboration and a linked consideration of DRR and CCA. The second group, *mismatches regarding norms*, discusses the underlying principles of activities undertaken in DRR and CCA. According to the review, the desire for stability and the consideration of risks as "a threat imposed by external forces leads to a lack of awareness and acceptance of responsibility" (Birkmann und von Teichman 2010, 5) and often hinders the opportunity to rebuild in an adaptive way. Thirdly, the **handling of knowledge** seems to be very different in the two working fields: „only weak links exist between the different types of knowledge, data and work applied by climate and risk scientists and practitioners, which hinders straightforward communication, collaboration and joint programming" (Birkmann und von Teichman 2010, 6). This exposition indicates which aspects need to be considered during the establishment of integration between different sectors. Building on this concept, de Leon & Pittock (2017) have evaluated the current situation in the Philippines. They put forward the claim that the system ought to be changed in a way that the **roots of vulnerabilities are addressed**, recognising the value of informal responses and considering the uncertainty of future climate change (Leon und Pittock 2017).

Ben Wisner states in his article form 2011 that there is a gap between the theoretical potential of integration and its practical usage. According to Wisner, "integration" in practice often means "to add" – adding a further topic of concern or further stakeholder to the existing system. However, he claims that "integration" has much more potential than this understanding lets on. Ideally, integrated working would mean "doing existing activities differently" (Wisner 2011). The most profound understanding of integration is reached by assessing and addressing root causes, considering the chains of circumstances leading to an increased disaster risk. Wisner puts forward two questions: firstly, of whether DRR is **integrated internally**. And secondly, of how **DRR is integrated in greater frameworks**, such as the Sustainable Development Goals (SDG) (Wisner 2011). He proposes five concepts that demand consideration when improving integration: 1) recognition of **complexity and uncertainty of disasters**, taking these situations as an opportunity and including them in the work of institutions and governments; 2) recognition of the "web of relations" in which disasters take place; 3) recognition of **temporal and spatial dynamics**; 4) recognition of **different kinds of knowledge**; and 5) recognition of commonalities in addressing different hazards: **improving peoples' resilience and stabilising their livelihoods** by improving mediating skills (e.g. non-violent communication) in conflict situations, access to knowledge, technology and natural resources, so that "solutions (…) be part of normal, every day-to-day life" (Wisner 2011, 5). Wisner justifies the need for integrated disaster risk reduction on the grounds that risks themselves have over time evolved into "systemic risks", causing secondary and tertiary impacts on different societal sectors.

Another interpretation of **institutional integration** is described in a study conducted by the Development Initiatives Strategies for Self-Sustainability[2]. The authors regard sustainability as a key interest of integrated service delivery through a network of complementary initiatives that orient themselves on the needs of people, "reinforcing conditions for sustained change and paving the way for resilience. […] Additionally, the sharing of funds, knowhow and human and material sources allows for the benefits in one area of the overall development strategy (health, education, water facilities, etc.) to be spread across others" (Via Axion 2012a; 2012b). One strategy among many to achieve the objective of sustained change is allowing for reinforced institutional integration as an area in a project that is in charge of ensuring that the different programs and administrative processes of the initiative are all designed, monitored, and evaluated in coordination, working transversally, and supporting each other" (so that they can share their human, infrastructural, financial, and other resources) (Via Axion 2012a; 2012b).

The Global Facility for Disaster Risk Reduction and Recovery (GFDRR), a grant-funding mechanism managed by the World Bank that supports disaster risk management projects worldwide, notes in its annual report from 2019 that GFDRR advises stakeholders on how to **integrate disaster risk management into portfolios with poverty reduction and other development goals**. In the 2012 Sendai Report compiled by GFDRR and the World Bank, it is argued that "the practice of disaster risk management is a defining characteristic of resilient societies, and should therefore **be integrated - or 'mainstreamed' - into all aspects of development**"(World Bank 2012c, 3).

A report by the World Bank which aims to provide guidance for Morocco's' development of an integrated risk management (IRM) strategy, states that: "**In an increasingly interdependent world**, managing risks requires recognising that risks can no longer be managed in isolation" (World Bank 2014, 13). According to the report, countries that have implemented IRM are more likely to experience **economic growth and social stability**. Although there is no one-size-fits-all approach to IRM, the report outlines its general benefits : 1) improved understanding of **key risks and the countries' capacity to reduce them**; 2) improved understanding of the **interdependencies of risks;** 3) improved decision making in terms of **cost-effectiveness** through **increased transparency and usage of synergies**; 4) enhancing communication and **coordination by establishing a common vocabulary and technology**; and 5) enabling decision-makers to make more strategic decisions. Implementation of the IRM approach requires that the risk management be: "(i) based on a coordinated inter-ministerial action at the highest level of government, facilitated by a National Office of Risk Management **(horizontal integration**) and institutionalised within each line Ministry in partnership with local actors **(vertical integration**); (ii) based on a clear but flexible integrated risk management strategy with milestones and deliverables so one can measure progress over time; and (iii) supported by appropriate risk information and management systems across different types of risk " (World Bank 2014, xv).

The „Sendai Framework for Disaster Risk Reduction 2015 – 2030" (SFDRR), building on the Hyogo-Framework, calls for "a more people-centred preventive approach to disaster" ((„Sendai Framework for Disaster Risk Reduction 2015 - 2030" 2015, 10). Disaster risk management can improve its efficacy by adopting multi-hazard and risk-driven approaches, as compared to an operational, response driven strategy. Local characteristics of the disaster must be considered. At the same time, DRR must be multi-

[2] Development Initiative Strategies for Self-Sustainability is a project of Via Interaxion in collaboration with the Center for Complexity Sciences and the Coordination of Humanities at the National Autonomous University of Mexico, the Department of International Education and Lifelong Learning (IELL) and the UNESCO Chair in Regional Education Development and Lifelong Learning at The Education University of Hong Kong (EDUHk).

sectoral, inclusive, and accessible, implying that all corresponding stakeholders be involved in the development and implementation of strategies. The diversity of the society should be reflected, and private, public and academic stakeholders involved. There is a need for effective collaboration across all sectors and stakeholders. Also, coordination between different disciplines within one sector is needed. A clear articulation of responsibilities must be ensured. The prime responsibility lies with the states; however, the central government shall share information and cooperate with all relevant national stakeholders. This can further be enhanced by **global collaboration and international support**. Decisions should be founded **on science-based information and complemented by traditional knowledge**. Furthermore, the Sendai Framework points out the importance of the **integration of different levels of authorities,** reaching from national to sub-national and to international cooperation. Local authorities must be empowered. As a foundational principle, the Sendai Framework states that "effective disaster risk management contributes to sustainable development" („Sendai Framework for Disaster Risk Reduction 2015 - 2030" 2015, 9) and points out the importance of the promotion and protection of human rights. Any post disaster strategy shall follow the principle of "building back better". The goal that is pursued by the framework is to "prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience" („Sendai Framework for Disaster Risk Reduction 2015 - 2030" 2015, 12). Mercer et al. developed a framework for integrating indigenous knowledge with scientific knowledge in order to reduce community's vulnerability to "natural disasters" (Mercer u. a. 2010).

The United Nations published in 2018 a *Words into Action Guideline* in support of the Sendai Framework for the integration of DRM with water management and climate change adaption. The position of many water basins at different borders demands a coordinated water management, as the risks and challenges are shared by the riparian countries. Additionally, "the coordination of water management can unlock benefits that cannot be achieved through unilateral development" (United Nations Office for Disaster Risk Reduction 2018, 10). The close relationship between the degradation of water-related ecosystems and the increase of hazards and reduction of peoples' resilience demands **an integration of ecological restauration**. Disaster Risk Management needs to be flexible enough and designed to address "the most likely future condition" ((United Nations Office for Disaster Risk Reduction 2018, 10). The uncertainty about future development due to ongoing climate change should be addressed by a "twin-track approach combining immediate action and further research" ((United Nations Office for Disaster Risk Reduction 2018, 10). **Data availability and information management** is crucial in future projections, identification of vulnerabilities and certain risks. **All governance levels must be included** in disaster risk management crossing administrative borders. **Cross-sectional work can benefit all stakeholders**. National and international legislations may provide the basis for effective collaboration (United Nations Office for Disaster Risk Reduction 2018). Similarly, there are efforts to improve DRR in mountain regions, by integrating ecosystem based DRR and community based DRR. The four principles proposed for this integration fit into the Sendai Framework and the Words Into Action guidelines (Klein u. a. 2019). Carey et al. (2015) applies a similar approach to cryospheric hazards occurring in mountain or ice-covered areas. According to this viewpoint, these hazards can be effectively addressed only if the response follows an integrated approach "involving natural sciences, engineering and planning, and the social sciences" (Carey u. a. 2015, 8).

According to Botzen et al. (2019), the holistic aspect of integration is important when applying it to risk management. This means that **multiple driving causes** for risk must be considered in the assessment. This can be achieved through **collaboration of different sciences**, such as "natural science, engineering, economics, and social science" (Botzen u. a. 2019, 289). The holistic approach must also be applied

when considering ways of mitigating the risk, leading to **different options to mitigate risk** such as "structural measures, emergency management or risk-transfer to insurances" (Botzen u. a. 2019, 290). This includes the **economic aspects** of risk management, too, considering costs for actions and benefits from prevention. Lastly, **other non-economic aspects** such as equity, the environment or the acceptable risk level must be considered (Botzen u. a. 2019).

The health emergency and disaster risk management (Health EDRM) framework published by the WHO in 2019 focuses on the health consequences of disasters and how they can be mitigated. The stated vision is:

> "the highest possible standard of health and well-being for all people who are at risk of emergencies, and **stronger community and country resilience**, health security, universal health coverage and sustainable development". (Lo u. a. 2017, 145).

Recommendations in the framework are guided by the following principles:

1) **risk-based approach**;
2) **comprehensive emergency management** (across prevention, preparedness, readiness, response, and recovery);
3) **all-hazards approach**;
4) **inclusive, people- and community-centred approach;**
5) **multisectoral and multidisciplinary collaboration;**
6) **whole-of-health system-based** (health resilience) approach;
7) **ethical considerations** (including evidence-based decisions)

To achieve this, the framework presents a set of components, including the inclusion and support of health emergency and disaster risk management consideration by other policies and strategies; that the planning and coordination of health emergency and disaster risk management considerations work hand in hand with the implementation of the Sendai Framework or the International Health Regulations; the implementation of coordinating mechanisms across various disciplines in the health care sector and other sectors at each level; and the importance of harmonisation of information and knowledge management, including collection, analyses and dissemination across sectors (Lo u. a. 2017, 145). In 2017, a group of international experts met to discuss how to proceed further in the promotion of Health EDRM. In addition to the principles mentioned in the framework, they stated that Health EDRM should follow an "all-needs approach, including physical, mental, and psycho-social health and wellbeing" (Lo u. a. 2017, 145). Furthermore, they emphasised the need for a universal terminology and the development of common assessment tools (Lo u. a. 2017). Gray et al. (2020) underline, in a recent review, the importance of mainstreaming mental health and psychological support in DRR and identified a lack of operational guidance and best practice examples how to achieve that.

Elaborations by other authors are in line with the aspects stated in more details above:

Due to the increasing impacts of climate change, several authors emphasised the need for linking disaster management and environmental assessments (Tajima, Gore, und Fischer 2014), for the inclusion of DRR aspects in the development of the built environment (Nguyen, Ginige, und Greenwood 2018) and the necessity to effectively include DRR in the climate change adaption to be able to improve sustainable development and poverty reduction efforts (R. Shaw, Pereira, und Pulhin 2010; R. Shaw, Pulhin, und Pereira 2010). Best practice examples from the Pacific regions show that CCA and DRR have many commonalities, such as the aim to improve resilience of the public (Tajima, Gore, und Fischer

2014). Several benefits of integrating CCA and DRR are also outlined: a holistic, people-centred approach to reduction of vulnerability was identified as more effective; work involving different sectors and stakeholders may bring together a variety of skills and experience that may benefit the community; the incorporation of local knowledge seems to improve the acceptance and participation of local community (Gero, Méheux, und Dominey-Howes 2011). In South Africa, researchers evaluated an approach in which experts from DRR and experts working in the field of ecosystem services generated shared knowledge by working on case studies together. The results showed that an approach of *knowledge coproduction* can lead to a more effective response (Belinda Reyers u. a. 2015). Sudmeier-Rieux et al. took this further in their book by discussing the interlinkages of DRR with climate change, migration and sustainable development (Sudmeier-Rieux u. a. 2017). The importance of integrating DRR and CCA at policy level to avoid inefficiency in governance was outlined by a study from Zambia. The need for horizontal integration prior to policy formulation was emphasised and the level of vertical integration evaluated (Pilli-Sihvola und Väätäinen-Chimpuku 2016). Mercer (2010) states in her article that DRR should be part of sustainable development efforts and the CCA should be included in DRR, making sure both are achieved by addressing the underlying vulnerabilities and risk factors. In the 6th guidance note on East-Asia and the Pacific Region by the World Bank Group, the authors once again emphasise the need to integrate DRR into community development programs and the necessity to mainstream gender aspects through the entire work (World Bank 2012a; 2012b). In their systematic analysis of the disaster risk in Darussalam, the authors propose an “integrated framework […] that can minimise social vulnerability, reduce disaster risk, and enhance community resilience and adaptive capacity as part of a strengthened governance mechanism” (Ndah und Odihi 2017).

2.2.1 Objectives of integrated management in Disaster Risk Reduction (IDRR)

There are several arguments supporting the value of integrated disaster risk reduction (IDRR). According to Wisner (2011), it is necessary to work integrated to be able to address the challenges caused by “systematic” risks effectively. According to the Sendai Framework, the aim of integrated disaster management (IDRM) is to work in a “people-centred preventive approach” and to ensure the disaster management always follow the principle of “building back better” ((„Sendai Framework for Disaster Risk Reduction 2015 - 2030“ 2015). The Pan American Health Organization states that integrated management of disasters (IDRM) increases the ability to “reduce its impacts and control the chaos (PAHO/WHO 2011). Shi et al. (2007) add to this that the objective must be to combine prevention with disaster resistance and relief. The vision of the Health Emergency and Disaster Risk Management clearly focuses on the improvement of the wellbeing of all people at risk (World Health Organisation 2019).

2.2.2 Commonalities in the core aspects of integration in the context of Disaster Risk

	Leading Principles						Structural aspec			
	Multi-hazard approach/ flexibility	Risk-driven/ disaster prevention/ improving resilience	Addressing root-causes	Mainstreaming of cross-sectional issues	People-centred approach	Consideration of spatial and temporal dynamics	External integration	Vertical integration	Horizontal integration	Harmonisation of information/ knowledge management and policymaking
Serra-Llobet	■							■	■	
Gopalakrishnan & Okada, 2007	■	■		■	■	■		■	■	■
Shi et al. 2007		■						■	■	■
Ikeda et al., 2008					■	■			■	
Birkmann, 2010 & Leon 2017			■			■	■			■
PAHO/WHO Emergency News, 2011	■	■								
Wisner, 2011	■	■	■			■				
Via Interaxion, 2012	■	■	■	■	■		■		■	■
World Bank, 2012	■	■		■		■	■			
World Bank, 2014	■	■						■	■	■
Sendai, 2015	■	■		■	■	■	■	■	■	■
UNDRR, 2018	■	■					■	■	■	■
Botzen et al., 2019			■	■					■	
WHO Health EDRM	■	■		■	■	■	■	■	■	■

Table 1 Commonalities in the core aspects of integration in the context of Disaster Risk Reduction

2.2.3 Glossary: Disaster Risk Reduction Terminology

Multi-hazard approach/adaptability

An approach that considers more than one hazard and thereby increases the flexibility and the capability to deal with that uncertain and yet unknow future risks (Gopalakrishnan und Okada 2007; „Sendai Framework for Disaster Risk Reduction 2015 - 2030“ 2015; Wisner 2011).

Risk-driven approach/disaster prevention/improving resilience

An approach that focuses on improvement of peoples' resilience and on "proactive work" (Gopalakrishnan und Okada 2007), rather than response-driven strategy („Sendai Framework for Disaster Risk Reduction 2015 - 2030“ 2015).

Addressing root causes

In order to prevent disasters and improve peoples' resilience, the root causes of vulnerabilities and disasters need to be addressed (Leon und Pittock 2017). This requires a comprehensive analysis (Wisner 2011).

Mainstreaming of cross-sectional issues

Throughout the entire process, several issues should be considered, due to their universal importance and impact. This includes gender aspects (World Bank 2012b), equity aspects (Gopalakrishnan und Okada 2007), human rights („Sendai Framework for Disaster Risk Reduction 2015 - 2030“ 2015) and the relevance of ecosystems and the "interconnection between nature and culture as well as their mutual conditionality" (Gopalakrishnan und Okada 2007).

People-centred approach

An approach that focuses on the affected people, their needs as well as their available means (Gopalakrishnan und Okada 2007; „Sendai Framework for Disaster Risk Reduction 2015 - 2030“ 2015).

Spatial and temporal dynamics

Integration can only take place when spatial dynamics during a disaster (local effects vs global effects) and temporal dynamics (short term vs long-term and preparedness, response, recovery phase) are considered (Wisner 2011; Birkmann und von Teichman 2010).

External integration in other goals/frameworks

External integration refers to the consideration of DRR in other frameworks and goals, such as sustainable development („Sendai Framework for Disaster Risk Reduction 2015 - 2030“ 2015), poverty reduction (World Bank 2012c) and climate change adaption (Birkmann und von Teichman 2010).

Vertical integration

Vertical integration refers to the cooperation of different government levels (Shi u. a. 2007; United Nations Office for Disaster Risk Reduction 2018; World Bank 2014).

Horizontal integration

Horizontal integration refers to the cooperation of different disciplines at one level (Gopalakrishnan und Okada 2007; „Sendai Framework for Disaster Risk Reduction 2015 - 2030“ 2015; Shi u. a. 2007; World Health Organisation 2019). The involvement of different disciplines will

lead to a variety of applied means during the process (Botzen u. a. 2019; Ikeda, Sato, und Fukuzono 2008).

Harmonisation of information/ knowledge management and policymaking

Harmonisation of information/ knowledge management and policymaking refers to the need to establish a common vocabulary (World Bank 2014), an effective and accessible information management (Gopalakrishnan und Okada 2007), the consideration of scientific and traditional knowledge (Mercer u. a. 2010; „Sendai Framework for Disaster Risk Reduction 2015 - 2030“ 2015), and the design of policies to make them are applicable to all relevant agencies (Shi u. a. 2007).

2.3 Integration: The Health Care Sector perspective

Acknowledgment of the importance of intersectoral collaboration for the obtainment of health for all people dates back to the 1978 Declaration of the Alma Ata, in which both **external** (between technical sectors) and sector **internal "collaboration"** is declared essential. The core message of the declaration is that health is:

> "[…] not merely the absence of disease or infirmity […] is a fundamental human right and that the attainment of the highest possible level of health is a most important world-wide social goal whose realization **requires the action of many other social and economic sectors in addition** to the health sector." (World Health Organization 1978)

Health in all policies (HiAP) is a term first coined in 2006 and that has developed since into an approach that aims at **integrating health aspects into policymaking** across sectors to "improve the health of all communities and people" (Centers for Disease Control and Prevention, Office of the Associate Director for Policy and Strategy 2016). HiAP recognises that health is influenced by a multitude of factors beyond healthcare and is, in many cases, beyond the reach of traditional public health activities. According to the CDC, the HiAP approach provides one way of achieving the National Prevention Strategy and Healthy People 2020 goals and enhance the potential for state, territorial, and local health departments to improve health outcomes. The HiAP approach may also be effective in identifying gaps in evidence and achieving health equity.

Over the past two decades, integrative communicable disease management has been defined largely by the WHO's "Integrated Disease Surveillance and Response (IDSR) approach, advocating that efficient outbreak response depends on well-functioning outbreak surveillance. Integrated surveillance of communicable diseases is "the sum of all surveillance activities which add up to the national surveillance system. The various surveillance activities become integrated into one system within the broader national health information system" (Pan American Health Organization, 2000, 2). The concept is based on the recognition that different specialised disease surveillance systems all need to conduct the same procedures (i.e., case-detection, confirmation, reporting etc.) and therefore **rely on the same infrastructure** (i.e., reporting standards, training of staff, laboratory support etc.). A comprehensive, multi-disease approach considering information from outside the health care system and recognising local characteristics seems to be the most efficient approach to improving surveillance and response activities.

The WHO European Office for Integrated Health Care Services in Barcelona[3], offers in its position paper on integrated care the following definition:

> "Integrated Care is a concept **bringing together inputs, delivery, management and organization of services** related to diagnosis, treatment, care, rehabilitation and health promotion. Integration means to improve the services in relation to "access, quality, user satisfaction and efficiency." (Policies u. a. 2020, 12)

[3] The WHO European Office for Integrated Health Care Services in Barcelona is an integral part of the World Health Organizations' Regional Office for Europe.

This definition ties in with the understanding of integrated care beyond the economic imperatives of integration, shared by the authors of this report. In their elaboration, they offer the distinction between **vertical** (collaboration over different levels) and **horizontal** integration (collaboration between different stake-holders at one level) (Gröne und Garcia-Barbero 2001).

A study conducted by Axellson and Bihari Axellson in 2006 applies a theoretical reconstruction based on published research on inter-organisational integration in public health and related welfare service to look at the often challenging complexity of integrating activities between different organisations. Following the **principle of vertical and horizontal integration,** the study states that "different forms of inter-organisational integration have different emphases on vertical and horizontal integration", with those different forms covering contraction, coordination, and collaboration (Axelsson und Axelsson 2006). The high degree of fragmentation and differentiation in the public health sector make cooperation, which includes vertical integration, near impossible. The researchers conclude that, in public health, **inter-organisational integration usually takes place in multi-disciplinary teams** which is a fragile and volatile form of organisation, requiring constant nurturing in order to survive (Axelsson und Axelsson 2006) .

In 2007, a joint statement issued by several American health care associations on the key principles of the medical home was released: "The Patient-Centered Medical Home (PC-MH) is an approach to providing comprehensive primary care for children, youth and adults. The PC-MH is a health care setting that facilitates partnerships between individual patients, and their personal physicians, and when appropriate, the patient's family" (American Academy of Family Physicians (AAFP) u. a. 2007, 1). One of the key principles is the integration of all health sectors involved (subspecialists, nursing, hospitals etc.), and the integration of the patients' social background. The integrated care is facilitated by appropriate information technology and communication infrastructure, ensuring that the patient receives care tailored to their needs and in a culturally and linguistically appropriate way. The statement/This approach to integrated healthcare also addresses further issues such as continuous quality improvement, evidence based medicine, improved access and the whole-person orientation, meaning that any needs related to health over the entire life span and the entire scope of medical services (prevention, acute/ chronic care and end of life-care) (American Academy of Family Physicians (AAFP) u. a. 2007).

In 2008, the Department of Health Policy, Development and Services within WHO issued a technical brief on the term "integration", in which six most frequently used meanings of the term are outlined (Waddington und Egger 2008):

1) Pairing preventive and curative services for one specific group of people (i.e., Integrated management programs of cardiovascular risk)
2) Pairing different services at one point of delivery (e.g., multi-purpose clinics etc)
3) Aiming for a continuum of care services over the lifespan of a patient
4) Collaboration between different levels of care delivery (vertical integration)
5) Joint management and policymaking between different stakeholders (horizontal integration)
6) Cross-sectoral work (i.e., health services, social services, education etc)

Compiling the meanings of the above points, the authors propose the following working definition of integration:

> "The management and delivery of health services so that clients receive a continuum of preventive and curative services, **according to their needs** over time and across different levels of the health system." (Waddington und Egger 2008)

In the Encyclopaedia of Public Health, integrated health care is described as a **system in which the entire spectrum of health care** is provided to the patient (Böcking und Trojanus 2008a). This encompasses both in- and outpatient services. Ideally, there should be a joint **agreement between all involved stakeholders** (i.e. health care providers, insurance companies and the patient) that the services provided are in accordance with the needs of the patient (Böcking und Trojanus 2008b).

In their article, Berwick at al. (2008) follow the principle of the ***triple aim***, stating that to improve quality of health care, the aims of **improving the individual experience of health care**, of **improving the health of the population** and of **reducing the per capita costs of care for the population** must be followed and at the same time well-balanced. According to the authors, this can only be achieved by establishing an ***integrator***, who can be anything from an insurer, a primary care group or a hospital. The key characteristic of the integrator is to give each aim equal attention for a specific population without excluding certain groups. **Linking health (including social and public health) organisations** together, while **considering patient needs** and **the costs of care** is the duty of the integrator. Besides the integrator, two other principles are required for the accomplishment of the triple aim: "1) recognition of the population as the central unit of concern 2) externally supplied policy constraints (such as a total budget limit or the requirement that all subgroups be treated equitably)" (p. 762). The integrator may fulfil several functions: a) **educating and involving the populations** b) strengthening the role of the primary health care provider, involving **primary care teams, not solely consisting of physicians** c) **increase preventive efforts** on a population basis d) establishing a transparent and, in regard to the triple aim, supportive financial system e) integration of the system at the macro level in **knowledge management, universal definition of used terms, and communication tools**. Technological developments make integrated care sees much more feasible than previously (Berwick, Nolan, und Whittington 2008).

Using the example of the Swedish healthcare system, Bengt Ahgren (2010) discusses whether integrated care models and economic competition among providers are compatible. He states that competition among single health care providers might hamper the development of integrated models. On the other hand, the stimulus of competition might be helpful for the development of improved performance. He concludes that if **competition and integration are combined,** patients would not have to choose between single health care professionals but between integrated health care arrangements (Ahgren 2010).

A research report by the Nuffield Trust providing an overview of integrated care in the National Health System (NHS) in the United Kingdom distinguishes between **internal integration** within the health care sector across primary, secondary, and tertiary care, and **external integration** of the health care with for instance social services (Peek und National Integration Academy Council 2013). With a focus on internal integration the authors continue to differentiate between integration and integrated care: "Integration is the combined set of methods, processes and models that seek to bring about this improved coordination of care" (p. 7), whereas integrated care "is an organising principle for care delivery with the aim of achieving improved patient care through better coordination of services provided" (p.7), which put the patients' needs and perspective at the centre of all discussions. They also emphasise the difference between **horizontal** (referring to the collaboration of networks or groups in the health economy) and **vertical integration** (referring to the collaboration of actors at different stages

of the health economy). According to the authors, the confusion around the term *integration* also stems from the fact that there are several types of integration; these do not have to be equally relevant to a specific project and can be considered separately. The five types of integration and allied processes are (S. Shaw, Rosen, und Rumbold 2011, 8):

1) **systemic:** coordinating and aligning policies, rules and regulatory framework

2) **normative:** developing shared values, culture and vision across organisations, professional groups and individuals

3) **organisational:** coordinating structures, governance systems and relationships across organisations

4) **administrative:** aligning back-office functions, budgets and financial systems across integrating units

5) **clinical:** coordinating information and services and integrating patient care within a single process (for example, developing extended clinical roles, guidelines and interprofessional education, or facilitating the role of patients in shared decision-making).

However, as discussed in the report, there are basic aspects that seem to generally facilitate integration, including the orientation of work towards shared goals, an underlying infrastructure (centrally supported) regarding communication and information, appropriate financial incentives, and effective clinical leadership (S. Shaw, Rosen, und Rumbold 2011). Finally, the authors emphasise that integration can take place to varying degrees, from "linkage over coordination to full integration" (p.15), and that there is not one type of integration that fits all. To conclude, integrated care is, according to the authors, a strategy "**concerned with improving patient care through better coordination**" (p.20), with the patient at the centre (S. Shaw, Rosen, und Rumbold 2011).

In a Cochrane review on the effectiveness of collaborative care for issues related to depression and anxiety, the authors summarise that the definition by Gunn et al. (2006) is widely accepted. This definition suggests that collaborative work comprises several aspects: firstly, the involvement of multiple professionals; secondly, a structures management plan for the patient, including scheduled follow-ups; and thirdly, improved communication between involved professionals (Archer u. a. 2012).

The American Psychologists Association (2013) states that the identifying feature of integrated health care is "a high degree of collaboration and communication among health professionals" (P 1). Professionals providing integrated health care take a holistic view on the health of the patients, including the biological, psychological, and social aspects. To be able to meet the individual needs of patients accordingly, an inter-professional team must be established involving a range of health professionals. The exchange of patient information would be essential within the team (American Psychological Association 2013).

According to the lexicon for *Behavioral Health and Primary Care Integration,* integrated behaviour and primary care should be delivered by a practice team, which **is tailored to the needs of the patient** and to the individual situation (Peek und National Integration Academy Council 2013): it should **involve a range of professions and expertise**, cover **prevention, acute and chronic disease care as well as mental health care**. The work of the authors builds upon a well organised **workflow and communication infrastructure**, **clearly distributed responsibilities, a shared-practice culture,** and **job training** in the field of integrated care. Involved care-providers share responsibility for a specific population of pa-

tients and are jointly accountable for their health outcomes. Lastly, the integrated primary and behaviour care uses a **systematic clinical approach** which **involves patients and their families in decision making**, **considers physical, psychological, cultural and social aspects of patients' health** as well as the organisation of the health care, and **ensures continuous care** by establishing follow-ups. Primary and behaviour care integration can only take place with the support of individuals and a community which favours integrated care, backed up by a **business model including office systems and leadership** and with a **continuous quality improvement** (Peek und National Integration Academy Council 2013).

In 2015, the WHO published a new "strategy on people-centred and integrated health services", which constitutes a "paradigm shift in the way health services are funded, managed and delivered" (World Health Organization 2015, 7). This has become necessary due to the challenges faced by global healthcare systems, such as growing and ageing populations, and the increasing burden of complex chronic conditions or health emergencies, such as the Ebola outbreak. To assist healthcare systems in becoming **more people centred** and integrated, they state five strategic directions:

1) involving the community in care delivery and in decision-making for individual health and on the policy level by providing resources, opportunities and skills
2) improving collective accountability and governance of health care providers by increasing transparency and creating robust systems
3) prioritisation of community and primary health care with an effective referral system to in-patient/secondary care and consideration of social aspects of health by promoting intersectoral work
4) coordination of care around the needs of the patient/population at every level of care, so that patients may receive the entire scope of medical services from prevention, through diagnostics and treatment to rehabilitation or palliative care over their entire life-span
5) creating an environment in which collaborative action is possible by adapting regulations, financial arrangements, current incentives, and policy-making

They further emphasised that the details in the delivery of people-centred and integrated care must **be adapted to the local circumstances** and should be **continuously evaluated at the basis of outcome indicators**. Furthermore, cooperation between the WHO, other national and international partners, civil society, health provider associations and researchers is needed for the implementation of the new strategy. People-centred and integrated health care builds upon further frameworks, such as universal health coverage or appeals to improve health emergency and disaster management. It is stated several times that integrated health care will improve the performance during a health emergency and especially the involvement of multiple-sectors in the healthcare system is critical for risk management for health (World Health Organization 2015).

In a viewpoint statement in The Lancet published after the Ebola outbreak in West Africa, the key aspects of resilient health care systems are discussed. The authors state that a resilient health care system is, among other things, *integrated,* joining diverse actors and ideas, **effectively sharing information and** coordinating **communication between all involved sectors** (Kruk u. a. 2015). Furthermore, they also emphasise the **need to integrate external sectors** such as agriculture or water sanitation **at all levels** and the need to **involve the local community** not only as recipients of health care but also **as decision-makers**. Further aspects of resilient health care systems are adaptivity, and the capability for self-regulation, diversity and awareness of present vulnerabilities and strengths of the system (Kruk u. a. 2015).

Clark et al. elaborate on the model of Mobile Integrated Healthcare (MIH), which "focuses on delivering necessary services at the most appropriate level of care and specialises in the care and management of complex patient populations at home and in other community-based settings. It accomplishes this by means of **integrating clinical, logistical, analytical, and educational competencies** in a collaborative effort that provides **patient-centred, team-based population-oriented care**" (Clarke u. a. 2017). Key elements of this model are: a physician led, always available multi-professional team, offering a wide range of medical services; a command-centre, coordinating communication among patients and care-providers; a team organising the referrals of patients from one care-giver to another; improved access to and quality of care for highly-vulnerably group aiming for a reduction in exacerbation of chronic conditions; the planning and coordination of care for chronic conditions for the future involving the patients' families; and the availability of unplanned care in emergencies (Clarke u. a. 2017).

Raney et al. (2017) published an overview of the core principles of effective integrated care and related tasks in a paper discussing possibilities of digital developments for the integration of primary and behavioural care. According to the overview, integrated care should comprise team-based care, referring to a multi-professional proactive team offering a wide range of services; evidence-based care; a measurement based improvement of care, referring to the necessity to measure patients' health outcomes and consequently improve the care quality offered; and a population-based care, referring to the joint responsibility taken by the team for a specific population (Raney u. a. 2017).

In the book "*New health systems – integrated care and health inequality reductions*", integrated health care is proposed as a possibility for **sustainable restructuring of the health care system**. The authors cite André Grimaldi (2016) and his definition of integrated health care: "The best-suited model is that of 'integrated medicine', which is simultaneously biomedical, pedagogic, psychological as well as social. It is medicine that is personalised across all these four elements, a partnership-based medicine that assumes a rapport, asymmetrical undoubtedly, but an egalitarian one, with the patient. Thanks to the therapeutic education of the patient and the empathy shown by the caregiver, each can partly take the place of the other while retaining their own role. Finally, it is a medical system that is coordinated between the township and the different health establishments and between the various professionals (doctors, paramedic workers and social workers) developing consistent practices and working in a complementary manner to achieve shared objectives and delivering concordant messages to patients and their entourage."(P 79) Benadoud and Callens add to this definition that telemedicine, management of patients' health data and social support also belongs to integrated health care (Bendaoud und Callens 2017).

In demarcation to *integrated* care, the term *integrative* has a different meaning. According to a literature review on the term *integrative care*, although there is no uniform definition, most definitions concur "that it [integrative care] is a combination of two or more paradigms of care or two or more types of treatment modalities" (Frisch und Rabinowitsch 2019). The similarity at first sight between the two terms causes potentially some misunderstanding.

Elaborations by other authors are in line with the aspects stated above:

Regarding vector-born outbreak management, a new strategy was discussed in the Lancet 2005 which encompassed a vertical and horizontal approach to mosquito control, which depends on collaboration with the community (Kay und Nam 2005). A similar approach of integrating the community was again successfully used in the Dengue outbreak in Guangdong Province, China in 2014 (Lin u. a. 2016). In the

article by Mughini-Gras et al. describing an "integrated outbreak management" to leptospirosis in dairy cattle herds, the term refers simply to the application of "enhanced biosecurity measures, whole-herd, antibiotic treatment and vaccination" (Mughini-Gras u. a. 2014, 2). In a similar case, the management of an outbreak of the multidrug-resistant Pseudomonas aeruginosa in an intensive care unit, through various means, including descriptive epidemiology, comprising retrospective case finding by reviewing the laboratory information system back to 2004 and prospective case finding by patient screening for MDR-PA, microbiological analysis, environmental screening and a case-control study (Knoester u. a. 2014, 207) was also described as *integrated.*

The importance of effective data management in disease surveillance systems when integrating different sources has been demonstrated by the example of the integrated system for Enteric Disease Surveillance and Outbreak Detection developed by the public health department in Connecticut (Soto u. a. 2015). A case study of the SARS epidemic in Singapore showed the effectiveness on an integrated communication strategy, involving mass media and interpersonal communication tools (Karan, Aileen, und Leng Elaine 2007). Raus et al. (2020) emphasise that there are different types of integration, ranging from clinical integration at the micro-level, through professional integration at the meso-level, to systemic integration at the macro level, also including normative integration or functional integration, which can happen at all levels. In the article, the expansion of the triple aim (Berwick, Nolan, und Whittington 2008) to a quadruple aim is further stated, also including the health care providers' experience. Lastly, they mention that it ought also to be considered how integration is intended to take place, as it is not an "all-or-nothing concept, but instead comes in a wide variety of degrees" ranging from mere coordination to full merging of entities (Raus, Mortier, und Eeckloo 2020, 14).

In a review of 25 years of international literature, Evans et al. (2013) found six major shifts in integration strategies of which some are recognisable in the references above: 1) a focus shift from horizontal integration to vertical integration, 2) a shift from concentrating on acute care in institutions to community-based health and social services, 3) a shift of the main intention moving from economic arguments to patient satisfaction and quality of care, 4) a shift in how integrated care is evaluated from organisational aspects to patient-centred variables, 5) a shift in change management from focus on changing the organisational environment to changing norms and cultural attitudes, 6) a shift in target group from integrating an entire population in a region to the focus on a specific population (Evans u. a. 2013). A review of international literature on the key elements of a governance model for integrated primary/secondary care underlines most of the findings documented in the various literature referenced in the document and found ten aspects that seem to be necessary for integrated care: joint planning, including collective decision making, multi-level partnerships; integrated information communication technology to support clinical exchange; a local change management; shared clinical priorities with a clear distribution of roles in the multidisciplinary team; incentives; focus on a specific population; continuous quality improvement based on collected data; continuing professional development/education; patient/community engagement in the development; and integrating innovations (Nicholson, Jackson, und Marley 2013). A few years after the publication of the WHO strategy on patient centred and integrated health services, Druetz (2018) claims the implementation of this strategy that in low and middle-income countries faces two major challenges. Firstly, interventions which are vertical, selective and disease-orientated receive more funding than projects with a system-wide, comprehensive, horizontal approach. Secondly, he points to the tensions between NGOs, implementing local interventions on their own and the national health strategies. Druetz argues for a discussion about the dialectic between vertical and horizontal approaches, and between cohesive and fragmented models of governance. For health systems in low-income countries to become integrated, he favours a better coordination of aid programs under the responsibility of the recipient state and a

strengthening in public health systems (Druetz 2018).
Nick Goodwin argues that each of the different understandings of integration is legitimate, and the diversity arises due to the different perspectives from which integrated health care is viewed. The author states definitions from four different perspectives (i.e., of the health system, of the managers, that of social science, and person/patient-centred), all of which are mentioned in either of the references above. He further emphasises that none of the definitions will work in every circumstance, referring to the dependency of the configuration of integrated care in specific situations. He concludes that "at its heart […] lies a commitment to improving the quality and safety of care services through ongoing and co-productive partnerships" (Goodwin 2016, 2).

2.3.1 Objectives of integrated management in health care

According to the WHO "integrated service delivery is the organization and management of health services so that people get the care they need, when they need it, in ways that are user-friendly, achieve the desired results and provide value for money" (Waddington und Egger 2008, 1). The aim of integrated care is quite common across definitions: providing a care that is in close relationship to the care-user, providing a continuity of care and a focus on preventive measures. Berwick et al (2008) explicitly reference the "triple aim" of improved individual health care, improved population health and improved costs. People/patient-centred care is at the core of most of the perspectives cited above, including that of Shaw et al. (S. Shaw, Rosen, und Rumbold 2011). Furthermore, some authors highlight that the resilience of health care systems lies in the integration of health care services and external sectors (Kruk et al., 2015) relevant to the attainment of the highest possible level of health. This leads back to the declaration of the Alma Ata in 1978 and the realisation that achieving integrated health management requires the action of many other social and economic sectors in addition to the health sector(World Health Organization 1978) .

2.3.2 Commonalities in the core aspects of integration in the health care sector

	Leading principles						Structural aspects					
	Comprehensive understanding of health	Patient-centred care	Community involvement in health care delivery	Continuous quality assessment	Continuum of care	Multi-Disease/purpose Approach	Joint Information/knowledge management and policymaking	Horizontal integration	Vertical integration	Offering the entire scope of medical services[1]	External integration	Appropriate financial incentives
Alma Ata Declaration 1978	■	■						■			■	
Health in all Policies	■										■	
PAHO 2000						■	■	■				
Gröne & Garcia-Barbero, 2001								■	■	■		
Axelson, Bihari Axelson 2006								■	■	■		
AAFP. 2007	■	■		■	■		■	■	■	■		
Waddington & Egger 2008	■	■			■	■	■	■	■	■	■	
Böcking & Trojanus, 2008		■						■		■		
Berwick et al. 2008	■		■				■	■			■	
Shaw et al. 2011		■					■	■			■	■
Archer et al.					■		■	■				
American Psychologists Association 2013		■					■	■		■		
Peek 2013	■	■		■	■	■	■	■		■		■
WHO 2015	■	■	■	■	■	■		■	■	■	■	■
Kruk et al. 2015			■				■	■	■		■	
Clarke et al. 2017								■		■	■	
Raney et al. 2017		■						■		■		
Bendaoud 2017	■	■					■	■				

Table 2 Commonalities in the core aspects of integration in the health care sector

2.3.3 Glossary: Health Care Sector Terminology

Comprehensive understanding of the constitutes of health

At the core of integrated health care lies a comprehensive understanding of health that goes beyond the bio-medical aspects and includes the social, psychological and cultural aspects of health (Bendaoud und Callens 2017; Berwick, Nolan, und Whittington 2008; Waddington und Egger 2008; World Health Organization 2015).

Patient-centred care

The patient's perspective lies at the centre of integrated care. All services should be tailored to the patients' needs. This also constitutes the basis upon which the shared goals of all actors are developed (American Academy of Family Physicians (AAFP) u. a. 2007; American Psychological Association 2013; Bendaoud und Callens 2017; Böcking und Trojanus 2008b; Raney u. a. 2017; S. Shaw, Rosen, und Rumbold 2011; Waddington und Egger 2008; World Health Organization 2015).

Community involvement in health care delivery

The local community/population should be involved in the decision making and in the health care delivery. This in turn makes the system more resilient and more likely to be accepted and trusted (Berwick, Nolan, und Whittington 2008; Kruk u. a. 2015; World Health Organization 2015).

Continuous Quality Assessment

A continuous quality assessment according to collected data on patients' outcome are an essential part of integrated health care (American Academy of Family Physicians (AAFP) u. a. 2007; Peek und National Integration Academy Council 2013; World Health Organization 2015).

Continuum of Care

The continuum refers to the fact that integrated care covers the entire lifespan, and that care will be delivered through all stages of life (American Academy of Family Physicians (AAFP) u. a. 2007; Archer u. a. 2012; Peek und National Integration Academy Council 2013; Waddington und Egger 2008; World Health Organization 2015).

Multi-Disease Approach

The multi-disease approach refers to a strategy by means of which efforts do not focus on a single condition, but encompass or are transferrable to other conditions or purposes (i.e. acute care/ chronic care/ emergency care) (Pan American Health Organization, 2000; Peek und National Integration Academy Council 2013; Waddington und Egger 2008; World Health Organization 2015).

Joint information/knowledge management and policy making

Joint information/knowledge management and policy making refers to the need for universal and effective information and knowledge distribution and processing. Policies should also be

comprehensible and applicable for everyone concerned (American Psychological Association 2013; Archer u. a. 2012; Bendaoud und Callens 2017; Berwick, Nolan, und Whittington 2008; Kruk u. a. 2015; Pan American Health Organization, 2000; Peek und National Integration Academy Council 2013; S. Shaw, Rosen, und Rumbold 2011; Waddington und Egger 2008).

Horizontal integration

Horizontal refers to the situation of multidisciplinary work at one level of the health care sector (American Academy of Family Physicians (AAFP) u. a. 2007; Gröne und Garcia-Barbero 2001; Pan American Health Organization, 2000; Waddington und Egger 2008; World Health Organization 1978).

Vertical integration

Vertical integration refers to the collaboration of actors at different levels of the health care system (American Academy of Family Physicians (AAFP) u. a. 2007; Axelsson und Axelsson 2006; Gröne und Garcia-Barbero 2001; Kruk u. a. 2015; Waddington und Egger 2008; World Health Organization 2015).

External integration

External integration refers to the collaboration of the health care sector with other sectors, such as social services or other technical sectors (Berwick, Nolan, und Whittington 2008; Centers for Disease Control and Prevention, Office of the Associate Director for Policy and Strategy 2016; Clarke u. a. 2017; Kruk u. a. 2015; S. Shaw, Rosen, und Rumbold 2011; Waddington und Egger 2008; WHO 1978; 2015).

Offering the entire scope of medical services

Integrated health care offers the entire scope of medical services, which includes prevention, diagnosis, treatment, care, rehabilitation and health promotion (Clarke u. a. 2017; Raney u. a. 2017; Peek und National Integration Academy Council 2013; American Psychological Association 2013; Gröne und Garcia-Barbero 2001; Waddington und Egger 2008).

Creating appropriate incentives

Appropriate (financial) incentives and business plans are necessary for the establishment of collaborative practice and integrated care (Peek und National Integration Academy Council 2013; S. Shaw, Rosen, und Rumbold 2011; WHO 2015).

2.4 Integration: The Humanitarian perspective

Humanitarian work takes place in a broad spectrum of contexts, ranging from sudden onset emergencies to conflict and protracted crisis. Whether or not humanitarian work is effective depends on a wide range of factors, including obvious conditions such as access, security, community acceptance, economic means, political will, and environmental preconditions. **The effectiveness** of humanitarian responses depends on whether governments, agencies, non-governmental organisations, and the affected societies can work together in a coherent and consistent way, leaving no-one behind and abiding by the principle of doing no harm. The 2018 Sphere project handbook, the flagship publication of the global Sphere movement aimed at improving the quality of humanitarian assistance, states:

> "Coordination mechanisms such as the cluster system[4] are required to establish a clear division of labour and responsibility and to identify gaps in coverage and quality. It is important to **prevent the duplication of efforts** and the waste of resources. The **sharing of information and knowledge between stakeholders**, along **with joint planning and integrated activities**, can also ensure that organisations **manage risk better and improve the outcomes** of a response." (Sphere Association 2018, 16)

Integrated management in humanitarian settings either refers to the integration of **different levels of services** within one technical sector (e.g., the integrated management of quality health care) or **intersectoral integrated planning** (e.g., between food security and protection technical sectors). As many humanitarian aid providers are engaged in multiple technical sectors, the potential for organisation-specific integrated humanitarian work exists. A recent example for this is the financial support given to UNICEF for its efforts in a multi-sectoral Preparedness and Response to the COVID-19 Pandemic project in Libya. The funding received from a single donor (USAID) allows the UN agency to address the outbreak through multiple sectors within UNICEF's remit including risk communication, water and sanitation, health and psychosocial support (UNICEF Middle East and North Africa 2020). Single sector service providers, i.e. organisations that operate in a single technical sector, depend on collaboration between partners to ensure their services are integrated into an intersectoral humanitarian response, should they wish to do so. Single sector providers are, for example, emergency medical teams that operate with one specific objective, such as providing lifesaving surgical services in the aftermath or a natural disaster or in conflict.

Another aspect of integration in the humanitarian context is the **integration of relevant crosscutting issues** including, but not limited to, **age, gender, disability, environment, and HIV** and AIDS in the response activities. One sound example of this, among many others, is the framework on integration of cross-cutting themes implemented by the Canadian Red Cross (Canadian Red Cross International Operations 2017) Integration in this respect is often interchangeably used with the term "**mainstream**".

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[4] A cluster is a group of agencies that gather to work together towards common objectives within a particular sector of emergency response. The cluster approach, instituted in 2006 as part of the UN Humanitarian Reform process, is an important step on the road to more effective humanitarian coordination. Ultimately, the cluster approach aims to improve the predictability, timeliness, and effectiveness of humanitarian response, and pave the way for recovery. It strengthens leadership and accountability in key sectors. It also seeks to enhance partnerships and complementarity among the UN, Red Cross Movement, and non-governmental organisations (NGOs) (WHO 2007).

2.4.1 Objectives of integrated management in humanitarian aid

The objectives of integrated management in humanitarian aid are to increase effectiveness and efficiency, by avoiding duplication of work and using synergies; and to improve risk management and the overall outcome of the aid program (Sphere Association 2018).

2.4.2 Commonalities in the core aspects of integration in Humanitarian Aid

	Leading principles			Structural aspects	
	People centred approach	Mainstreaming of cross-cutting issues	Consideration of temporal dynamics	Vertical Integration	Horizontal Integration
Sphere Standards 2018	■				
ISAC Reference Tool		■		■	■
2020 Nigeria Humanitarian Response Plan	■	■	■		■
Humanitarian-development-peace-nexus			■		
Canadian Red Cross, Framework on integration of cross cutting themes		■	■		

Table 3 Commonalities in the core aspects of integration in Humanitarian Aid

2.4.3 Glossary: Humanitarian Perspective Terminology

People centred approach

People-centred approaches in development focus on improving local communities' self-reliance, social justice, and participatory decision-making (Sphere Association 2018, 16).

Mainstreaming of cross-cutting issues

During the entire process of humanitarian work, aspects related to gender, age, disabilities, or HIV/AIDS must be considered (Canadian Red Cross International Operations 2017).

Consideration of temporal dynamics

Humanitarian services should be provided throughout the entire process, covering the preparedness, response, and recovery phase (Canadian Red Cross International Operations 2017).

Vertical Integration

Collaboration across different levels of services (local, subnational, national) within the technical sector is described as vertical integration (Nigeria Humanitarian Response Plan 2020).

Horizontal Integration

Collaboration across different technical sector (food security, water management, healthcare etc.) is described as horizontal integration (Nigeria Humanitarian Response Plan 2020).

2.5 Integration: The Business Management perspective

Integrated business management builds on the concept of sales and operation planning processes (S&OP). S&OP aims at an improved coordination between the "commercial and supply functions" and eventually balancing the supply and demand (Manning 2020). This basic concept has been constantly developed further over the last four decades. Financial aspects have become more involved, resulting in a **management process** as opposed to a simple supply process. Subsequently, the portfolio and product planning have also been integrated in the planning process, followed by a consideration of the **external environment** of the business (Manning 2020). According to Manning, Integrated Business Planning does not describe a new process, but rather the **continuous development of S&OP**. Integrated business planning (IBP) describes a planning process in which all internal functions of the business and the external circumstances are integrated (Manning 2020).

Oliver Wight describes IBP as "the business planning process that **extends the principles of S&OP** throughout the supply chain, product and customer portfolios, customer demand and strategic planning, to deliver one **seamless management process**" (Wight 2020). He claims further that, through IBP, businesses will be able to improve their **efficacy** and **their capacity to predict and react to changing conditions** (Wight 2020).

In his blog post, Phil Marshall states that IBP is often seen as best practice. He regards IBP as the incorporation of financial and operational data. By integrating strategic plans with sales, operational and financial plans, the links between resources, capabilities and results will gain importance, resulting in a business plan, to which every department adds their perspective. This is especially important because independent "business silos" (Marshall 2019) across the supply chain cause an inefficient overall performance. Integrative business planning would improve the visibility of the individual activities and how they impact the overall financial situation of the businesses, improve the flexibility on the market, as data from all parts of the business can easily be drawn together, improve accountability of individual departments towards the overall performance of the business and would also avoid duplication of work in the different departments (Marshall 2019).

According to Shannon Kearns (2019), IBP expands S&OP, resulting in a comprehensive, "true" business plan, rather than a separate a supply plan, a production plan, a financial budget, and so on. It acknowledges every single "business silo" and their own functions and processes. IBP enables the business to quantify the business risk for the entire company, in order to to conduct "what-if scenario planning", thereby allowing the business to meet the current challenges faced by most companies. These comprise increasing demand volatility, the supply complexity based on logistics operations and subcontracting manufacturing, the input cost volatility in the global markets, and the non-linear connection between costs and volume, as some cost-variation depends on the volume, and some are dependent on the time. Applying IBP would increase the profit improvements, enable the usage of a "single planning solution" across the business, **improve the risk mitigation and forecasting capabilities** by

strengthening cross-functional collaboration, improve the alignment of the business as well as its capability **to adapt to changes quickly and efficiently**, reduce planning time-frame to just a few days, and increase the overall trust in the company (Kearns 2019).

2.5.1 Objectives of integrated management in business management

There are several objectives in integrated business management. Firstly, several authors concur that integrated working would improve the performance of the business by improving the capability to predict changes (Wight 2020) and risks for the entire company (Kearns 2019). It can also enable the business to react to changing conditions better, thereby making the business more flexible (Kearns 2019; Manning 2020; Marshall 2019; Wight 2020). In general, the work can become more effective because duplication of work is avoided (Marshall 2019; Kearns 2019) or because a "single planning solution" can be applied (Kearns 2019). Integrated business management aims to increase the profit improvement (Kearns 2019).

2.5.2 Commonalities in the core aspects of integration in Business Planning

	Leading principle	**Structural aspects**		
		Internal integration		External Integration
	Evolution of S&OP	Joint management process across company departments[1]	Acknowledgement of individual departments	Consideration of external circumstances
Manning 2020				
Wight 2020				
Marshall 2019				
Kearns 2019				

Table 4 Commonalities in the core aspects of integration in Business Planning

2.5.3 Glossary: Humanitarian Perspective Terminology

Evolution of S&OP

The integrated business planning builds upon the sales and operation planning processes S&OP (Manning 2020; Wight 2020; Kearns 2019).

Joint management process across company departments

Joint management process across company departments refers to the need for communication infrastructure and data management processes that work across departments borders (Kearns 2019; Manning 2020; Marshall 2019; Wight 2020).

Acknowledgement of individual departments

By establishing an integrated business management process, the contributions of each department and the interlinkages between the silos become more present (Kearns 2019; Manning 2020; Marshall 2019)

Consideration of external circumstances

Through an integrated business management, consideration can be given to external circumstances outside the business. This enables the business to better predict external changes (Kearns 2019; Manning 2020; Marshall 2019).

2.6 Integration: The Educational perspective

In the education system, integration seems to mean one of two things: enhancing student performances through different style curricula or the integration of students with different needs and learning abilities or pupils from different backgrounds into one school/class system.

Within the education sector, the term "**integration**" often goes hand in hand with "**inclusion**", the former being the mere description of education of children with special needs in mainstream settings, the latter on the other hand having a much more profound meaning**. Inclusion** in education involves the process of: increasing the participation of students with disabilities in, and reducing their exclusion from, curricula and communities of local schools; restructuring the cultures, policies and practices in schools so that they respond to the diversity of students' needs; accepting diversity as normal and as a rich source for all students; responding to the diverse needs of all students; accommodating both different styles and rates of learning; ensuring the quality of education to all students through appropriate curricula, support and teaching strategies; and **accepting that inclusion in education is one aspect of inclusion in society** (Mason 2002).

In Northern Ireland, an integrated school system refers to bringing together children and adults from Catholic, Protestant and other backgrounds, aiming to achieve a religious balance of pupils, teachers and governors. Self-respect and respect for others are strongly encouraged (Integrated Education Fund 2014). An integrated ethos is nurtured to ensure inclusion of people from different religions, cultures, genders, abilities and socio-economic backgrounds (Integrated Education Fund 2014).

In the Hallmark public school system in India, the integrated approach to learning means combining what students learn in the classroom with the solution of real-world problems. An integrated curriculum entails making significant connections between subjects or skills that usually address several different subject areas. Integrating the curriculum can improve learning experiences and is designed to focus on learning within the curriculum. It focuses on making connections among concepts and experiences so that information and skills can be applied to novel and complex issues or challenges (Hallmark Public School 2020).

In their book *Meeting Standards Through Integrated Curriculum*, Susan M. Drake and Rebecca C. Burns (2004) define three approaches to integration: **multidisciplinary** (disciplines around a theme), **interdisciplinary** (integrating sub-disciplines within a subject area e.g., history, economics, governance, politics) and **transdisciplinary** (organising the curriculum around common learnings across disciplines). The authors include numerous examples on how each of these integrated approaches to learning increases student performances, often considerably (Drake und Burns 2004).

2.6.1 Objectives of integrated management in the education system

Improved performance and inclusion of a diversity of students is at the core of integrated management in the education system and key to achieving improved student performances (Drake und Burns 2004; Hallmark Public School 2020).

2.6.2 Commonalities in the core aspects of integration in the education context

	Leading principles		**Structural aspect**
	Acknowledging and value diversity ("integrated ethos")	Adapting the response to the needs of the students	External integration
Mason 2002			
Integrated Education Fund			
Hallmark Public School System India 2020			
Drake, Burns 2004			

Table 5 Commonalities in the core aspects of integration in the education context

2.6.3 Glossary: Education Perspective Terminology

Acknowledging and valuing diversity ("integrated ethos")

Acknowledging and valuing diversity means that students who differ in regard to their religious background, to their capabilities and to their needs are equally involved in the curriculum and individual contributions are equally valued (Hallmark Public School 2020; Mason 2002).

Adapting the response to the needs of the students

This implies the teaching process will be adapted according to students' needs (Drake und Burns 2004; Hallmark Public School 2020; Mason 2002).

External Integration

Integrated education systems have a focus on enabling students to transfer the knowledge acquired in school to situations in the real world (Hallmark Public School 2020). Promoting the *integrated ethos* in the education system will also contribute to a increased acknowledgement of diversity in the entire society, from school situations to real-word (Mason 2002).

3. Conclusion

3.1 Commonalities in the core aspects of integration across all perspectives

The last step towards a working definition of the term "integration" is the extraction of commonalities across the considered perspectives. By extracting the commonalities across the considered perspectives, the authors generate a broad understanding of the term "integration". Our working definition will be developed pursuant to these findings.

The authors arrived at eight different aspects that were common among the five perspectives considered in this report. The commonalities can be grouped into **three structural aspects, four general principles** and **two objectives.**

3.2 Structural aspects

1) Harmonisation of information/knowledge management and policy making

Harmonisation of information/knowledge management and policy making implies that there is a common agreement and understanding of how data is collected, analysed and communicated. It also refers to the need of a policy form that is applicable and usable to all relevant actors. Terms used should be clearly defined to avoid misunderstandings during application of the. *Harmonisation of information/ knowledge management and policy making* is the basis for internal and external integration, as it is necessary at all interfaces. Its necessity is referenced in Disaster Risk Management, in the health care sector and in the business management perspective.

2) Internal integration

Internal integration refers to the integration of one sector within itself (Wisner 2011). Two aspects of internal integration are highlighted in DRM, in the health care sector and the humanitarian perspective: *vertical* and *horizontal integration*. In the education sector, only horizontal integration was mentioned. This refers to the collaboration of different actors at one level in a multidisciplinary team. Vertical integration describes how well the different levels (e.g. subnational, national, international) are working together.

3) External integration

External integration refers to the integration of one sector with other sectors. This means that one sector is considered in other frameworks or overall goals. Authors from the DRM perspective argue, for instance, that disaster risk reduction should be included in other policies such as the portfolio for poverty reduction (World Bank 2012c). In the health care perspective, the term cross-sectoral work was used. This referred to the consideration of, for instance, social services or education in health care and health promotion (Waddington und Egger 2008) or the incorporation of information from outside the health care sector during an outbreak (Pan American Health Organization, 2000).

3.3 Leading Principles

1) Mainstreaming cross-sectional issues

Mainstreaming of cross-sectional issues refers to the necessity of considering gender, age, disability and human rights aspects in every action planed or taken, as the complexity of processes can thereby be addressed appropriately and can be "taken as a chance" (Wisner 2011). It was mentioned in all perspectives, apart from the business management perspective.

2) Multiple-hazard approach

The multiple hazard approach stipulates that an integrated management strategy should not be thought as a single-issue strategy. Ideally, an integrated management strategy offers one solution that can be transferred and applied to in various scenarios. Furthermore, the multiple hazard approach also recognised the interrelations between different hazards and the possibility of concurrent occurrence of multiple hazards. This principle was mentioned in the DRM perspective, in the health care sector and the humanitarian perspective.

3) People-centred approach

The *people-centred approach* dictates that the actions planed or taken match peoples' needs. It is mentioned explicitly in the Sendai-Framework on Disaster Risk Reduction („Sendai Framework for Disaster Risk Reduction 2015 - 2030" 2015). It also appeared in the health care sector several times, as it was clearly stated that services must be delivered according to patients' needs. Thirdly, the integrated approach in the education sector stipulates that teaching should be adapted to the students' needs.

4) Consideration of spatial and temporal characteristics

This principle refers to the need to adapt preparedness, response and recovery planning and implementation to local conditions and to temporal changes over time. Local conditions may include special hazards during Disaster Risk management or cultural aspects to be taken into consideration when planning and implementing activities. Temporal changes during the work appear over time, from as early as the preparedness and planning stage, to response and recovery activities.

3.4 Objectives

Considering the perspectives analysed in this report, two objectives appear repeatedly. The first refers to the focus on prevention rather than response, and in a similar vein, the focus on the improvement of resilience to cope with changing conditions and disasters. This applies to business (Business Management), to patients (Health Care Sector) as well as to the whole society (DRM). The second common objective refers to the usage of resources. Integrated management aims to optimise the application of financial, material, and human resources by avoiding duplication of work, striving for synergies, or using established infrastructure for several purposes.

1) Improved effectiveness with a strong intent to improve prevention and resilience

Integrated work aims to improve its effectiveness with the intention to focus on prevention and public resilience. In the disaster risk reduction perspective, a risk-driven approach was favoured as compared to a response-driven approach. The health care perspective mentions the importance of health promotion and prevention, besides diagnostics and treatment activities (Gröne und Garcia-Barbero 2001). In humanitarian work, the goal to manage risks more effectively is emphasised

(Sphere Association, 2018). The integrated business management intends to optimise businesses' resilience to changing conditions (Kearns 2019).

2) Improved efficiency/Optimised usage of resources

Improving efficiency/Optimising usage of resources refers to the question of how available resources can be used more efficiently by creating synergies, repurposing infrastructure for multiple causes and avoiding duplication of work. This objective was mentioned in the health care and humanitarian sectors and the business management sector.

3.5 Commonalities in the core aspects of integration across all perspectives

	Structural Aspects				Leading Principles				Objectives	
	Harmonisation of information/ knowledge management & policy making	Internal integration		External Integration[2]	Mainstreaming of gender, age, sex, disabilities, human rights & cross-sectional issues	Multiple hazard approach	People-centred approach	Consideration of spatial & temporal characteristics	Improved effectiveness with strong intend to improve prevention & resilience	Improved efficiency
		Horizontal integration[1]	Vertical integration							
Disaster Risk Reduction										
Health Care Sector										
Humanitarian Work										
Business Planning										
Education system										

Table 6 Commonalities across all perspectives

[1]=cross-sectional work, multidisciplinary work
[2]=integration into other frameworks/strategies; consideration of external circumstances

3.6 Definition: integrated management in the context of disaster prevention, preparedness, and response

After an examination of the range of perspectives and an extraction of commonalities, we suggest the following definition for the field of (complex) crisis and disaster risk management:

Integrated management of crises and disasters (IMCD) refers to a complex and dynamic societal process in which all aspects perceived as relevant by horizontally and vertically as well as internally and externally cooperating actors are understood in their context, and corresponding effective and efficient measures are taken in a coordinated manner by all relevant actors to prevent crises or disasters and, in case of their occurrence, to avert harm and ensure the well-being of the people at risk under dynamically changing conditions.

Frame diagram: Integrated Management

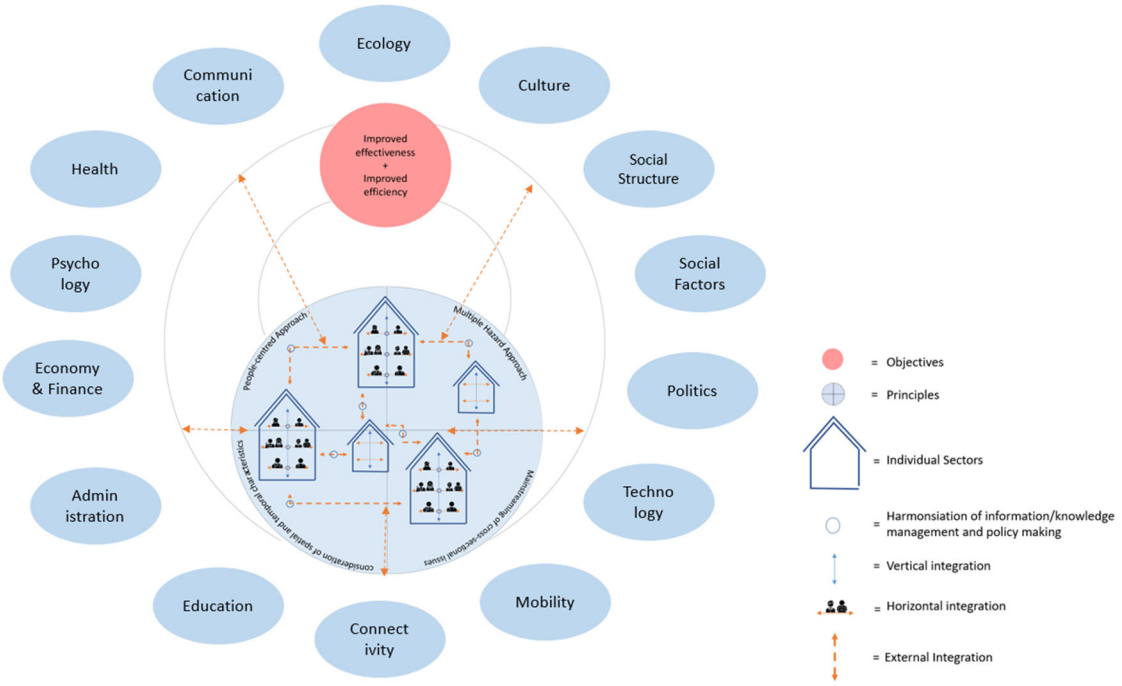

Figure 1 Aspects of integrated management and how they are interlinked

4. Integrated (Pandemic) Management in German and Armenian pandemic preparedness plans and legislation

5.1 Background

Part two of this working paper provides a short empirical analysis of the mapping of integrated management in publicly accessible preparedness and response plans and legislation in Armenia and in Germany (Figure 2). The mapping uses a matrix (Tables 7, 8 and 9) and builds on the working definition of "integration in the context of crisis and disaster prevention, preparedness and response" and the structural aspects, leading principles and objectives derived from the extensive literature review across disaster risk reduction, health care, humanitarian aid, business planning, and the education system.

These structural aspects, leading principles and objectives were reviewed in 7 German (5 national, 2 sub-national) and 6 Armenian preparedness response plans and legislative documents publicly available to the research team. Following the understanding that, if the presence of structural aspects, leading principles and objectives are present in key documents in German and Armenian pandemic preparedness plans and legislation, an important first step in the process towards integrated *pandemic* management can be concluded. However, caution should be applied, as the theoretical presence of integrated management on paper does not automatically imply its presence in the day-to-day action of actors in the preparation and response to a crisis or a disaster. The actual implementation may pose challenges and issues unforeseen in the theoretical approach. There is a need, therefore, to extend research beyond this report to analyse the practical processes and cooperation in comparison with the existing frameworks. But even more the need to build capacities in terms of research- and management -centres becomes evident enabled to implement the demanding criteria of a real integrative management approach.

Documents have been selected based on their public availability in either English or German. The selection of a few key documents is reflective of their importance for the current pandemic disease outbreak context. Language limitations of the authors presented an obstacle to accessing additional Armenian documents, likely leading to bias in access to and full comprehension of relevant pandemic preparedness and response plans and legislature in Armenia. The quality of English translations, including translation errors as much as abbreviated document versions, must be noted as an additional limitation. While two sub-national documents were selected in Germany, there were no sub-national documents publicly accessible to the authors for Armenia, which is reflective of one of the key differences between the two countries in being centrally (Armenia) and federally governed (Germany). The authors do not intend to draw any comparison between the two countries nor between the different documents and instead regard at each document individually for any evidence of integrated management. There is also no intention to quantify or evaluate such evidence.

The list of documents reviewed in this mapping exercise can be found in Figure 2:

Document Overview: Mapping exercise integrated management

	Overview of documents mapped				
	LEVEL	Topic	Document Title	Author	Publication
GERMANY	National	Coronamanagement	Ergänzung zum Nationalen Pandemieplan – COVID-19 – neuartige Coronaviruserkrankung	Robert Koch Institut	Apr 20
	National	Pandemiemanagement	Nationaler Pandemieplan Teil I - Strukturen und Maßnahmen		2016
	National	Pandemiemanagement	Nationaler Pandemieplan Teil II - Wissenschaftliche Grundlagen	Robert Koch Institut	2016
	National	Pandemiemanagement	Epidemisch bedeutsame Lagen erkennen, bewerten und gemeinsam erfolgreich bewältigen	Robert Koch Institut: Team Preparedness and Response (Fachgebiet Surveillance in der Abteilung für Infektionsepidemiologie des Robert Koch-Institutes)	October 2019
	National	Pandemiemanagement	Gesetz zur Verhütung und Bekämpfung von Infektionskrankheiten beim Menschen (Infektionsschutzgesetz - IfSG)	Bundesamts für Justiz	July 2000 updated November 2020
	Subnational	Pandemiemanagement	Bayerischer Influenzapandemieplan		
	Subnational	Pandemiemanagement	Empfehlungen zur Umsetzung des nationalen Influenzapandemieplans in Sachsen-Anhalt	Ministerium für Arbeit, Soziales und Integration des Landes Sachsen-Anhalt	updated on 05.03.2020
ARMENIA	National	DRM	Disaster Risk Management National Strategy of the Republic of Armenia	Extract from the protocol of the government session of the Republic of Armenia	April 2017
	National	DRM	Protocol decree N 14 on the approval of the disaster risk management national strategy and the action plan	Prime Minister of the Republic of Armenia	April 2017
	National	National Security	National Security Stategy of the Republic of Armenia	Office of the Prime Minister	April 2008 updated July 2020
	National	Civil Protection	Law of the Republic of Armenia on population protection in emergency situations	President of the Republic of Armenia	December 1998 updated 2020
	National	Rescue Services	Law of the Republic of Armenia about rescue services	Accepted by National Assembly of the Republic of Armenia on June 8, 2005	August 2005 updated March 2020
	National	Public health and safety	Law of the Republic of Armenia about ensuring sanitary and epidemiologic safety of the population of the Republic of Armenia	Prime Minister of the Republic of Armenia	December 1992 updated September 2020

Figure 2: Documents reviewed for integrated management aspects

5.2 Key findings

- The terms integration/integrated management are partially or fully absent in most documents. Instead, relatively frequent reference is made to coordination and/or collaboration, indicating a tendency towards integrated management without it becoming explicit. Where the term is used, there is little explanation as to its meaning and no action(s) defined that would further support an understanding of why and how the term is used in the specific context. One such example is the *Protocol decree № 14 on the approval of the disaster risk management national strategy and the action plan*, in which the closest reference to integrated management is documented on page two: "Availability and further development of a common system for disaster risk management will enable horizontal and vertical cooperation among all state and non-governmental structures involved in disaster risk management processes, including the civil society" (Protocol decree № 14).

- The *Disaster Risk Management National Strategy of the Republic of Armenia* and *The action plan Protocol decree № 14 on the approval of the disaster risk management national strategy and the action plan* come closest to meeting structural aspects, guiding principles and objectives as defined as key components of integrated management, however, even the Protocol Decree № 14 only establishes „*that*" stakeholders work together on specific areas of the strategy, not „*how*". It must thus be assumed that the actual manifestation (planning documents, working agreements, division of responsibilities/labour) of how to manage the complex, dynamic processes of integrated preparedness and response to disasters takes place at the operational and (inter-)organisational level.

    - The importance of the presence of structural aspects and guiding principles in legislative documents cannot be underestimated, however, as this provides the ground on which society and its individual stakeholders can build their collaborative commitment to integrated management in disaster preparedness, response and reduction and henceforth reach the objectives of increased efficiency and effectiveness as per the working definition.

    - Furthermore, their presence in legislature enhances accountability at the highest level to ensure (and regulate) stakeholder compliance.

- Both countries updated pre-existing key preparedness and response plans in 2020, indicating that neither country was prepared to fully meet the demands of a public health emergency of the scale of the SARS-CoV-2 pandemic – albeit that health experts around the world have issued respective warnings for many years and outbreaks such as SARS (Severe Acute Respiratory Syndrome) in 2003 and MERS (Middle Eastern Respiratory Syndrome) in 2015 indicated at regional level(s) how devastating the impact of disease outbreaks on ill-prepared societies can be.

- Not all documents lend themselves in their structure and intent to the mapping of any or all structural aspects, leading principles, and key objectives. One such challenging document is the *Declaration of a State of Emergency in the Republic of Armenia* from March 2020, which provides a binding set of rules rather than regulatory legislation with division of tasks among key stakeholders. Another document that provides challenges in the mapping process is the *Law of the Republic of Armenia ensuring sanitary and epidemiologic safety of the population of the Republic of Armenia* which, amended 6 times including in September 2020 since its first

publishing in 1992, presents a list of directives, orders, rights and obligations to be implemented by different stakeholders including individual members of the public. The document, however, is key to epidemic prevention and response and thus omission in the mapping process unconceivable.

- After thorough scrutiny, none of the documents reviewed meets the above proposed definition of integrated management, and the interpretation of the presence of structural aspects and leading principles was applied with generosity, capturing tendencies and progresses rather than factual presence in most cases. The mapping outcome indicates additionally that the prevention of pandemics is not yet understood as (the most important) part of an integrated pandemic management.

The mapping of presence of any structural aspects in each of the selected documents

Structural aspects as derived from the extensive literature review and determined for the mapping exercise were the most prominent elements found in the documents reviewed.

Harmonisation of information/knowledge management & policy making is discernible in all but two documents, though to different degrees, ranging from glossaries of common terminology to being the core purpose of the document.
(Internal) Horizontal Integration is somewhat more difficult to discern than the above and is a subject that allows for much assumption and reading between the lines. While not formally documented, this may well be common practice at the operational level, as it is almost a must to ensure operability in any practical sense. Further research at the operational level, including through stakeholder interviews and after-action reviews will help determine to what degree horizontal integration is taking place.
(Internal) Vertical Integration is easier to discern in almost all documents as frequent reference is made to different levels of authorities and distribution of responsibilities. However, the authors have been quite generous in confirming presence of vertical integration while in fact the level of integration is not completely clear in any of the documents and could be limited to merely essential collaboration, or full coordination and networking.
External Integration is easy to discern in most of the documents reviewed with multiple references made to other technical fields being part of the preparedness and response. What is lacking in most publications is an explicit commitment to or framing of integrative approaches across disciplines in any of the documents to lead to actionable guidance at the operational level.

The mapping of presence of any leading principles in each of the selected documents

Leading principles in and of themselves are either salient statements that form the backbone of a document or are hidden in subtext, between the lines or are not included at all. It is therefore difficult to make a general statement as to their presence in the selected documents, especially as the documents reviewed differ in their purposes and therefore provide a range of findings, as documented below:

Mainstreaming of gender, age, sex, disabilities, human rights, and cross-sectional issues
While these are barely discernible in most documents, these crucial mainstreaming characteristics have a particularly prominent role in Armenian legislation. Further research into this

leading principle could take place outside of the research of integrated management and become a research subject within itself.

Multiple Hazard Approach Those documents that are pandemic specific unsurprisingly do not state any multi hazard approach while all disaster response plans reviewed are respectively very explicit on this principle.

People-centred approach All but one document from the review takes a people centred approach. In some documents this is clearly stated, whereas in others a strong intent is discernible.

Consideration of spatial and temporal characteristics There are mixed findings on this leading principle, with spatial considerations being more present than temporal characteristics. In hindsight, it would have been sensible to map these characteristics separately.

The mapping of presence of any objectives in each of the selected documents

Both of the following objectives were easily mappable across most documents. They are in themselves straightforward and logical, and in theory should be at the core of every plan following an integrated approach, regardless of the document.

Improved effectiveness with strong intent to improve prevention and resilience

An overwhelming majority of the documents describe their purpose as being to provide effective aid and to do so in a sustainable manner.

Improved efficiency

The objective of improved efficiency does not appear as transparently and saliently as the first objective. The absence may well be a consequence of the nature of the documents themselves. This finding indicates clearly that this area requires more research, including expanding the mapping to encompass documents that include fiscal planning and analysis.

Tables 7, 8 and 9 below are **excerpts** of the original Excel map, broken down into the three categories (solely for editing purposes). Access to the original map can be requested from the authors.

Excerpt Table: Mapping of presence of Structural Aspects

Document Name	Structural Aspects			
	Harmonisation of information/ knowledge management & policy making	Internal Integration		External Integration
		Horizontal Integration	Vertical Integration	
Nationaler Pandemieplan Teil I - Strukturen und Maßnahmen (Robert Koch Institut 2017)	**Yes** to common language between the various stakeholders, yet impossible to discern whether this translates into a harmonised approach to policy making and knowledge management	**Yes -** Within the health sector at national level. Taking place under the leadership of the RKI.	**Yes,** between " State and federal level, and federal level and supra-national institutions like the World Health Organization (WHO) or the European Centre for Disease Prevention and Control (ECDC)	**Yes/No:** The document indicates alignment with regional and global plans. no indication that it is in any way integrated in other national preparedness and response plans, nor recognition that this should be the case.
Nationaler Pandemieplan Teil II - Wissenschaftliche Grundlagen (RKI 2016)	**Yes** to clear and concise language using common terminology and denomination as can be expected in a scientific paper	**Yes,** in a wider sense through representation of multiple health sector stakeholders in the RKI expert advisory group who contributed to the scientific section of the pandemic preparedness plan	**Yes,** between " State and federal level, and federal level and supra-national institutions like the World Health Organization (WHO) or the European Centre for Disease Prevention and Control (ECDC)	**Somewhat present**: An RKI led Expert Advisory Board on Influenza consists of multiple stakeholders from within the health sector, i.e. considered relevant for internal horizontal integration, but also incorporates other (predominantly) political divisions and departments and thus also reflects external integration.
Ergänzung zum Nationalen Pandemieplan – COVID-19 – neuartige Coronaviruserkrankung (RKI 2020)	**Yes,** this is a core intention of the document	**Not** present	**Yes** between " State and federal level, and federal level and supra-national institutions like the World Health Organization (WHO) or the European Centre for Disease Prevention and Control (ECDC)	**Yes**, though not very explicit: Neben dem primären Anliegen, dem Schutz der Gesundheit, ist vor allem bei schweren Epidemien oder Pandemien aber auch die Produktion, Verteilung, Versorgung und der Verkehr sicherzustellen und sind ggf. Maßnahmen zur Bewältigung von Ausfällen und Engpässen zu ergreifen. P 8

Epidemisch bedeutsame Lagen erkennen, bewerten und gemeinsam erfolgreich bewältigen (RKI 2019 o. J.)	**Not evident**	**Yes**: The responsibilities and competencies in the case of epidemically significant situations are not centralised in Germany but are distributed amongst many actors as well as among institutions at the federal, state, and local levels. The effective vertical cooperation of different levels and the horizontal (intersectoral) cooperation are therefore of critical importance for the management of the situation.	**Yes**: Evident on P.37: "The responsibilities and competencies in the case of epidemically significant situations are not centralized in Germany but are distributed over many actors as well as over institutions at the federal, state and local level. The effective vertical cooperation of different levels and the horizontal (intersectoral) cooperation are therefore of decisive importance for the management of the situation."	**Yes:** Evident on P.38: "In addition to the health authorities, depending on the situation, local veterinary authorities, emergency services, police, those responsible for disaster control, representatives of the primary care providers (Association of Statutory Health Insurance, physicians, hospitals) and, if necessary, also persons with political decision-making authority are integrated in these infection control staff"
Gesetz zur Verhütung und Bekämpfung von Infektionskrankheiten beim Menschen (Infektionsschutzgesetz - IfSG) (IFSG 2020 o. J.)	**Yes:** § 2 Begriffsbestimmungen (P.5) provides a glossary of commonly used language and the intend to support preparedness planning and response with a law indicates a harmonised approach to pandemic management in the country	**Yes:** "The protective measures should take into account the respective Infection events regionally based on the level of the rural districts or urban districts the threshold values in accordance with sentences 4 to 12, if there is an infection within a country are not cross-regional or similar." P.38	**Yes**, though emphasis is on vertical coordination, rather than integration	**Yes**: "The cooperation of federal, state and local authorities, doctors, veterinarians, hospitals, scientific institutions and other parties required for this purpose should be designed and supported according to the current state of medical and epidemiological science and technology". P.4
Bayerischer Influenzapandemieplan (Bavaria 2020)	**Yes:** the Bayrische Staatsministerium für Gesundheit und Pflege oversees communication across all federal ministries with the aim to ensure a coordinated approach to risk and crises communication (P.90).	**Not explicit:** The text reads as though horizontal integration can be assumed. As observed in other documents, the reference to coordination could "mask up" as integration P.91	**Yes**: "One of the core elements of the Bavarian pandemic influenza master plan is smooth coordination between the institutions involved at the state, federal and EU level." P.4.	**Yes -** Experts from the Bavarian State Ministries for Health and Care (StMGP), Family, Labor and Social Affairs (StMAS), Environment and Consumer Protection (StMUV), the Interior, for Sport and Integration (StMI) and the Bavarian State Chancellery are involved. There are also representatives of the State Office for Health and Food Safety, the district governments and health authorities. Associations, institutions, and representatives of science have also been involved from the start. P.4

Empfehlungen zur Umsetzung des nationalen Influenzapandemieplans in Sachsen-Anhalt (Ministerium für Arbeit, Soziales und Integration des Landes Sachsen-Anhalt 2020)	**Yes**, the document is considered the blueprint for all stakeholders involved at state level to align their processes, accordingly, contribute and adapt their management and policies respectively	**not explicit**	**Yes** "The cooperation of the responsible authorities is essential to ensure the flow of information so that everyone involved in the process can assume the same level of knowledge and act in a coordinated manner." P.16	**Yes** "The cooperation of the responsible authorities is essential to ensure the flow of information so that everyone involved in the process can assume the same level of knowledge and act in a coordinated manner." P.17
Disaster Risk Management National Strategy of the Republic of Armenia (*Disaster Risk Management National Strategy of the Republic of Armenia* 2017)	**Yes,** several references are made to the embedment of the strategy within other legal documents of the country and international frameworks like Sendai, P.4	**Yes:"** Availability and further development of a common system for disaster risk management will enable horizontal and vertical cooperation among all state and non-governmental structures involved in disaster risk management processes, including the civil society" P.3. The formulation shys away from outlining what exactly this "cooperation" ought to look like	**Yes: "**Availability and further development of a common system for disaster risk management will enable horizontal and vertical cooperation among all state and non-governmental structures involved in disaster risk management processes, including the civil society "P.3.	**Yes:** Multiple references made, among them: The Ministry of Healthcare of the Republic of Armenia ensures preparedness of general and specialised medical institutions […] and ensures integration of disaster risk management component into sectoral development programmes P.14.
Protocol decree N 14 on the approval of the disaster risk management national strategy and the action plan (Government of Armenia 2017 o. J.)	**Yes**: "[…] it involves regulation of the processes for disaster information sharing among the stakeholders of emergency management regardless of organisational and legal structure" P. 5	**Strong intent:** "[...] a favourable environment is established by the Disaster Risk Reduction National Platform and regional teams for disaster risk reduction are established" P.5. This indicates a "crossover" between DM sector specific vertical governmental integrative work and external integration	**Strong intent**: "There are developed, contemporary and holistic grounds for disaster risk management cooperation among governmental and non-governmental structures P.5	**Strong intent:** "Introduction page 2: Availability and further development of a common system for disaster risk management will enable horizontal and vertical cooperation among all state and non-governmental structures involved in disaster risk management processes, including the civil society."
National Security Strategy of the Republic of Armenia (Government of the Republic of Armenia 2020)	**No reference** to harmonisation of information/knowledge management but **Yes, reference** to harmonisation in policy making in relation to national security P.38	**No references** identified	**No references** identified	**Yes: "**Armenia will implement an integrated state policy to ensure the biological security of the population. We shall strengthen system response mechanisms and risk management techniques for biological hazards and threats, and epidemics" P.36

Law of the Republic of Armenia on population protection in emergency situations (Government of Armenia 1998)	**Yes,** in the form of a glossary for terminology used and alignment to other laws	**Not discernible**	**Yes,** but **barely discernible.** The document does not refer to any form of networking, collaboration or coordination but lists the different duties at various level of government and civil society engagement in emergency situations	**Barely discernible:** Somewhat manifested as such: "This law defines the bases and the arrangement of population protection in emergency situations, the rights and responsibilities of state and local authorities, enterprises, institutions, organizations, [...] as well as officials and the citizens in this sphere." P. 1
Law of the Republic of Armenia about rescue services EXERPT as published by: Document from CIS Legislation database © 2003-2020 SojuzPravoInform LLC N.B. text was translated by AI translator and is not a valid juridical document (Government of Armenia 2005)	**Yes**, in a broader sense, initial clarification of terminology, alignment with other documents of relevance feeding into the overall policy making process in Armenia: "Article 3. Legal regulation of activities of the Rescue service" P.1	**Yes,** with several bodies of the rescue forces: special rescue group, special fire crew & rescue and firefighting group (P. 1)	**Potentially Yes, BUT** unclear in formulation, likely in place at state to local level operationalisation	**Yes,** with multiple stakeholders at national and local level " participates in coordination, the organization of activities of state bodies and local self-government for civil defence and protection of the population in emergency situations and in informing on these questions" as well as international " [...] P.3
Law of the Republic of Armenia about ensuring sanitary and epidemiologic safety of the population of the Republic of Armenia(Government of Armenia 2020 o. J.)	**no** deliberation discernible	**no** deliberation discernible	Repeated references to state vs local self-government bodies, local authorities, however, integrated operational modi **cannot be discerned** from the document	Stakeholders external to the health sector are mentioned, however, integrated operational modi **cannot be discerned** from the document

Table 7 Mapping of presence of Structural Aspects

Excerpt Table: Mapping of presence of Leading Principles

Document Name	Leading Principles			
	Mainstreaming of gender, age, sex, disabilities, human rights, and cross-sectional issues	Multiple Hazard Approach	People-centred approach	Consideration of spatial and temporal characteristics
Nationaler Pandemieplan Teil I - Strukturen und Maßnahmen	Partial, through highlighting the need to protect "vulnerable groups" P.24; furthermore, different age groups are being considered, esp. in surveillance planning and vaccine acceptance and tolerance P.17 there is no trace of gender/sex/disabilities/human rights or other cross-sectional issues being included	Not considered - specific singular planning for pandemic events	Yes, three out of four objectives of the pandemic preparedness plan are directly aimed at putting the people at the centre, with the 4th indirectly doing so as well. P.8	Yes, spatial (global, regional, national, and sub-national) considerations are recognised and addressed P.8. Temporal considerations are reflected in both the lay out of the plan in several phases (aligned with WHO defined global phases) P. 7 and recognition that pandemic events can require prolonged periods of time P.11 with potential to stretch human and material resources over time
Nationaler Pandemieplan Teil II - Wissenschaftliche Grundlagen	Not explicit, age distribution among patient groups is certainly discussed but no recommendations made on mainstreaming concerns of certain groups into the planning, as this is not the intention of the document	No indication in the document that there is an inter-connectedness between pandemic events and other hazards. The document is not intended to formulate recommendations or approaches; however, there would have been room there to incorporate a multi hazard view. High costs associated with non-pharmaceutical measures, however, are mentioned P.113	Not explicitly formulated: The document is clearly defined as scientific based decision-making tool P.7	Spatial - Yes: the report points to the need to de-couple national and sub-national responses from global and regional responses P.211 Temporal - Yes, the plan incorporates an important lesson from previous pandemic events P.59
Ergänzung zum Nationalen Pandemieplan – COVID-19 – neuartige Coronaviruserkrankung	No: Vulnerable groups and age are mentioned, however, as with the NPP I and NPP II, this cannot be considered as mainstreaming of specific groups of subjects into the planning process	No: highly specific to the SARS CoV-2 pandemic	Yes: specifically vulnerable population groups	Yes: As stated in both NPP I and NPPI II above, this document recognises both spatial and temporal characteristics of the current SARS CoV-2 pandemic

Epidemisch bedeutsame Lagen erkennen, bewerten und gemeinsam erfolgreich bewältigen	**Not evident**	**Yes, with limitation**, though to other pathogenic 'situations': The framework concept is supplemented or further specified by various location and agency-specific concepts. These situation- or agent-specific concepts in their totality cover a variety of possible challenges in dealing with epidemically significant situations and should therefore also be transferable to situations that are triggered by other pathogens P.6	**Yes,** as in patient oriented clinical care: "In all phases of the situation the medical care takes precedence above all else." P.6	**No** for spatial characteristics and **Yes** for temporal characteristics of a response to an epidemic, which are described and depicted in graphic on P.7
Gesetz zur Verhütung und Bekämpfung von Infektionskrankheiten beim Menschen (Infektionsschutzgesetz - IfSG)	**Not explicit**	**No:** this is a stand-alone law with the dedicated purpose to prevent and respond to infectious disease outbreak, with specific elaboration on COVID 19 "§ 28a Besondere Schutzmaßnahmen zur Verhinderung der Verbreitung der Coronavirus-Krankheit-2019 (COVID-19)" P.37	**Yes:** The aim of the document itself is stated as: " The purpose of the law is to prevent communicable diseases in humans, to identify infections at an early stage and to prevent their spread " P.4	**Yes** on spatial: on P.38 "The protective measures should be based on the threshold values in accordance with sentences 4 to 12, taking into account the respective infection process, regionally based on the level of the rural districts, districts or urban districts, unless the infection occurrences within a country are regional or similar are." **No** on temporal.
Bayerischer Influenzapandemieplan	**No**, age as in the national plan is considered but not very explicit and clearly not mainstreamed, nor are gender, sex disabilities, or other aspects	**No:** As with the national pandemic plan, there is no consideration of multiple hazard approach, the document is embedded in the overall disaster management structure of the state but there is no mention of/linkage with other hazards	**Yes,** though not explicitly stated; the document needs to be read in detail to see how people are at the centre of it	**Yes:** Spatial as in recognising, as in the national plan, the need to de-couple the response to a pandemic at local level from the global, regional, and national responses for the sake of local conditions/specificities P.7;also temporal, again in alignment with the national plan and in fact WHO the recognition of phases and their individuality P.30
Empfehlungen zur Umsetzung des nationalen Influenzapandemieplans in Sachsen-Anhalt	**To some degree:** "The many individual households, households with children and the concerns of the socially disadvantaged, people with disabilities, the helpless and others must also be taken into account." P.44	**Yes, with limitation, though to other pathogenic 'situations'**: "In principle, the pandemic framework plan of the state of Saxony-Anhalt can also be used for a pandemic caused by other respiratory viruses such as SARS-CoV-2." P.7	**Yes:** Patients and their relatives, workers and their families are at the center of the very operational section of the report	**Yes,** as the NPP the document refers both to spatial and temporal characteristics of pandemic events and the importance to consider both. Furthermore, on P.24 the continuousness of the process is described

Disaster Risk Management National Strategy of the Republic of Armenia	**Yes,** mentioned as "work in progress/development tendencies" (P. 11, points 11 and 12) and implementation processes on P.10	**Yes, by definition;** also, because the "Disaster Risk Reduction National Platform" foundation was established by the Government of Armenia decree N 1694-N dated 2nd December 2010 aimed at the establishment of a disaster risk reduction multi-sectoral mechanism with the involvement of all stakeholders P.6	**Yes,** as documented on P.3: "The main objective of disaster risk assessment is to provide safety for all the representatives of the society with equal response to the specifics and the level of preparedness of women, men, children, the elderly, persons with disabilities, persons with special needs and socially vulnerable groups"	**No,** neither of the two are explicitly mentioned throughout the document
Protocol decree N 14 on the approval of the disaster risk management national strategy and the action plan	**Yes**: "The main objective of disaster risk assessment is to provide safety for all the representatives of the society with equal response to the specifics and the level of preparedness of women, men, children, the elderly, persons with disabilities, persons with special needs and socially vulnerable groups" P.3	**YES,** the action plan is laid out to target multiple hazards. Hazards are outlined in the preamble of the document.	**Strong intent** – though not fully embracing people's self-reliance and capacities "to support and promote active involvement of educational institutions, persons with disabilities, socially vulnerable groups and other players in disaster risk management policy making and implementation processes" P.9	**Yes:** Recognition of the impact that short term, medium term and long-term programmes will have under the implementation of the stringent strategy are outlined on P.19 and P. 22
National Security Strategy of the Republic of Armenia	**Yes:** "in Armenia, the individual holds ultimate value. We are committed to fully protecting the rights and freedoms of every person residing in Armenia, as well as fully integrating ethnic minorities and vulnerable groups into every area of public life and the system of state" P. 24 and „The low level of women's participation in various areas of social and political life […] The state shall, therefore, make sure to grant equal rights, opportunities, and conditions to women and men, as well as stimulate the integration and participation of women in political decision-making." P.24	**Yes,** the strategy incorporates several types of hazards, including health, environmental, bio-chemical, conflict	**Yes,** with multiple reference made throughout the document, e.g.: "The people and its free will are the principal source of authority. Any attempt to subvert or distort the free expression of the people's will shall be viewed as an action directed against the state and the nation. P.V	**Not discernible**

Law of the Republic of Armenia on population protection in emergency situations	There is reference made to the **prioritisation of certain citizens in recovery/relief efforts** with little indication of the exact vulnerabilities presented (other than age): The protection of population is organised and carried out in a distinguished way due to age, residence, military and economic peculiarities prescribed by the order of RA Legislation P. 4	**Yes**, the document addresses all hazards that can cause an emergency situation	**Yes**, highlighted as a priority among multiple other aspects, the supremacy of securing human life and health is of key relevance to this law. "The expected results from the strategy implementation with the application of economic, structural, legal, social, healthcare, cultural, educational, environmental, technological and political tools would include disaster prevention and mitigation, disaster risk reduction and management, effective response to disasters, strengthened post disaster recovery capacities and building a culture of resilience." P. 22	**not discernible**
Law of the Republic of Armenia on rescue services EXERPT as published by: Document from CIS Legislation database © 2003-2020 Sojuz PravoInform LLC N.B. text was translated by AI translator and is not a valid juridical document	**Not discernible**	**Yes:** "The rescue service performs measures for prevention, minimization, and liquidation of possible effects of emergency situations, functions of civil defence, protection of the population and economic units (territories) during emergency situations and war-like situation, and also rescue, emergency, urgent emergency recovery operations, fire extinguishing and other types of activity" P.1	**Yes,** guiding principles include: "priority of providing life and human health"P1	**Not discernible**
Law of the Republic of Armenia on ensuring sanitary and epidemiologic safety of the population of the Republic of Armenia	**Not discernible**	**Yes:** In the sense of multiple epidemiological hazards including bio-chemical, vector born etc. However, **does not** meet the concept of multiple hazard approach as per our definition	**No,** not at all, very top down, directive, instructive, not consultative	**Tentative** - in spatial terms, i.e., consideration of local characteristics of a disease outbreak

Table 8 Mapping of presence of Leading Principles

Excerpt Table: Mapping of presence of Objectives

Document Name	Objectives		Remarks (incl. structural aspects and leading principles)
	Improved effectiveness with strong intent to improve prevention and resilience	Improved efficiency	
Nationaler Pandemieplan Teil I - Strukturen und Maßnahmen	Yes: The document in its current version is built on a) the WHO "template" from 1999 and has undergone several revisions, each incorporating lessons identified in pandemic events. The strong intent to strengthen surveillance and multiple tasks to be considered in the inter-pandemic period in particular indicate that the aim of the document is indeed to continuously improve effectiveness through prevention and resilience building	No indication that the plan is developed with efficiency in mind	The judgments made here are very generous especially where the coordination between different actors indicate some form of integrated pandemic management. Networking, collaboration, or "Beruehrungspunkte", alone do not constitute an integrated approach, especially not one as far-reaching as is defined in this project
Nationaler Pandemieplan Teil II - Wissenschaftliche Grundlagen	Yes: Built on lessons learned from re 2009 H1N1 influenza pandemic, the document aims to strengthen the systems in place to predict and monitor potential disease outbreaks in inter-pandemic phases, in order for early detection and response mechanisms to help mitigate the impact of an infectious disease outbreak	Yes, there is an element of cost effectiveness in the document, esp. in the section on non-pharmaceutical interventions, whereby a number of studies have been evaluated on their effectiveness (e.g. border control/screening) in relation to their costs. The report does not however issue any recommendations specific to cost saving interventions (other than on a temporal basis where certain actions make more sense at certain moments in the response) and therefore is not predominantly concerned with improved efficiency	
Ergänzung zum Nationalen Pandemieplan – COVID-19 – neuartige Coronaviruserkrankung	Yes: the document is an addendum to the existing national pandemic plan with the intent to effectively respond the specific outbreak of a novel Corona Virus (SARS-CoV-2).	Not explicit	

Epidemisch bedeutsame Lagen erkennen, bewerten und gemeinsam erfolgreich bewältigen	**Yes,** chapter 5.5 addresses the need to evaluate epidemiological outbreaks on their effectiveness and efficiency, among other criteria P.30 [...]"Surveillance, diagnostic capacities" should continue to be available or in which areas more human, material, and financial resources would have to be reserved for the next situation ("surge capacity"). The contingency plans include roles, responsibilities, and financing to be critically examined and, if necessary, to be determined. " P.33	**Yes:**In order to be better prepared for upcoming situations, the findings of the evaluations must be converted into action plans with clear responsibilities and time schedules. The implementation of these plans must be checked continuously and the plans themselves must be adapted. Where deficits became evident in the context of the situation (e.g., in the case of plans, basic surveillance instruments for the spread of disease, burden of disease, supply situation, documentation), these deficits must be eliminated. P.30	Please note page numbers are the PDF page count at the top of the document, whereas the page numbers at the bottom of the document are not corresponding
Gesetz zur Verhütung und Bekämpfung von Infektionskrankheiten beim Menschen (Infektionsschutzgesetz - IfSG)	**Yes:** Effectiveness is at the core of the law, which is accordingly very explicit and detailed in its regulations. Effective management of an epidemiological outbreak is mentioned in several places, e.g. on P.38	**Not explicit**	
Bayerischer Influenzapandemieplan	**Yes,** building on proven systems to effectively utilise existing infrastructure, incorporating lessons from previous pandemic events, utilising the inter-pandemic phase for capacity building and resilience are all components of the report. Example P.55	**Yes,** efficiency is a key component of the plan with strong emphasis on collaboration between departments and resource sharing. P.5:	The document is much more explicit on both vertical and horizontal coordination within the health sector and with other sectors and levels (sub-national, national, regional, global), however there is no direct mention or clear indication of an integrated approach in general, and not in line with the definition guiding this process
Empfehlungen zur Umsetzung des nationalen Influenzapandemieplans in Sachsen-Anhalt	**Not explicit**	**Not explicit**	Tthe document follows the structure of the NPP including key formulations on central themes such as objectives, etc
Disaster Risk Management National Strategy of the Republic of Armenia	**Yes,** as testified in one of multiple citations: "The disaster risk reduction national strategy was approved by the Government of Armenia decree N 281-N dated 7 March, 2012 aimed at building a resilient country with the provision of gradual increase of individual and social safety and sustainable development" P.6 and "“Building back better” – continuous strengthening of the country’s capacities and opportunities for disaster preparedness, as well as disaster rapid response and more effective post disaster recovery." P.9	**Yes,** an entire chapter is dedicated to improving efficiency: CHAPTER XI. FINANCIAL SOURCES OF THE STRATEGY IMPLEMENTATION	The expected results from the strategy implementation with the application of economic, structural, legal, social, healthcare, cultural, educational, environmental, technological, and political tools would include disaster prevention and mitigation, disaster risk reduction and management, effective response to disasters, strengthened post disaster recovery capacities and building a culture of resilience P.20

Protocol decree N 14 on the approval of the disaster risk management national strategy and the action plan	**Yes:** "Prevention of hazards and disaster recovery are the preconditions for sustainable development of the country. Modernization and further development of the disaster risk management system is an important step" P.4. Also very clearly stated in the formulation of the priority actions and objectives of the strategy, on P.9	While not explicitly stated as such, the intent can be **interpreted into** the stated priority actions and objectives of the strategy on P.9; on page 12 reference is made to reducing duplication of functions - indicating intent to improve efficiency (without naming it)	This document comes the closest to meeting structural aspects, leading principles and objectives as outlined in part one of the working paper on integrated management.
National Security Strategy of the Republic of Armenia	**Yes,** one key reference with regards to health is found on P.29 "The state shall employ effective procedures to prevent the infiltration of infectious diseases posing a public health threat"	**Yes,** strong emphasis on prevention in all aspects of the strategy	
Law of the Republic of Armenia on population protection in emergency situations	**Yes,** to effectiveness as the structure put in place indicates the commitment to effective emergency management. There is no indication however that prevention is being furthered. The document itself however can be testament to some level of resilience being established by the systems put in place to operationalise the law	**No references made**	
Law of the Republic of Armenia on rescue services EXERPT as published by: Document from CIS Legislation database © 2003-2020 SojuzPravoInform LLC N.B. text was translated by AI translator and is not a valid juridical document	**Yes:** "integrated approach to reducing effects of emergency situations, and also organization of events on ensuring normal functioning of all levels of system of protection of the population in case of liquidation of these effects" P.3	**Yes,** several passages refer to prevention of emergencies on P.2 "develops offers on financing of actions of civil defence and elimination of emergency situations" and "will be organized by implementation of state programs according to the prevention of the emergency situations and mitigation of consequences developed together with state bodies and local self-government, the organizations, indicating strong interest is prevention over response	The translation of the document is questionable in quality and may be misleading in some instances
Law of the Republic of Armenia on ensuring sanitary and epidemiologic safety of the population of the Republic of Armenia	**Tentative** as in directing early detection, early action to disease outbreaks - effectiveness however, esp. in the changes made to the law in September 2020 are reactive in nature to ensure the effective management of an outbreak occurring, rather than preventative (which in part can be attributed to the original document from 1992)	**Not** discernible	This key document in the context of an epidemic/pandemic does not meet most of the structural aspects and guiding principles we look for in determining whether integrated management is reflected in legislation

Table 9 Mapping of presence of Objectives

5.3 Conclusion and outlook

Mapping the presence of integration in pandemic preparedness and response plans and legislation reveals mixed results (WHO 2008 continuum of integration). The findings of the mapping of both German and Armenian pandemic preparedness and response plans and legislative documents underline this statement. None of the mapped documents fit the definition of integrated pandemic management proposed in this report, and it is difficult to discern even a very loose interpretation of an integrated approach. However, collaboration and coordination, both vertical and horizontal, are key elements in most of the documents and lend support to the conjecture that factual integration is taking place at the operational and organisational level. Gradual processes of integrated preparedness and responses may be underway "downstream", with anything from *loosely* coordinating activities *occasionally* between different sectors or divisions within one sector/structure, to rooting integration at the core of the planning process, to seamless implementation of a multi-sectoral, multi-hierarchical implementation, being conceivable. Various configurations of integrated pandemic management may also appear, depending on local circumstances.

Further research is required to assess the presence of integrated management in preparedness and response plans at operational (i.e., in and between organisational, ministerial, national, regional, and local levels), for instance through after-action reviews, lessons learned exercises, and key stakeholder interviews.

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