

Foresight approaches in global public health

A practical guide for WHO staff



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Foreword



Science and technology are moving at an ever-increasing pace, offering endless possibilities for global health. To engage with new developments and stay ahead of scientific and technological advances, we must proactively identify, anticipate, and prepare for issues that hold great potential and challenges for global health.

WHO's Science Division provides global leadership in translating the latest science, evidence, innovation and digital solutions to improve health and health equity for all. This is reflected in WHO's 13th Programme of Work (2019–2023)

...WHO's normative guidance will be informed by developments at the frontier of new scientific disciplines such as genomics, epigenetics, gene editing, artificial intelligence, and big data, all of which pose transformational opportunities but also risks to global health.

The tools and techniques described in this document are designed to enable technical and operational teams to engage actively with change, open spaces for discussion, leverage expertise to formulate a vision and take the necessary steps to realize that vision. In this way, tools and techniques described in this document provide staff with the opportunity to participate and to contribute meaningfully to the content of new policy initiatives and to provide feedback on implementation.

This document aims to set futures-thinking in motion, from asking simple questions to setting up larger projects. It is important to recognize that, although there are global trends, needs, challenges and requirements are local, highly diverse and context dependent. In order for foresight approaches to be useful, they must be sensitive to different needs, contexts and perspectives.

Foresight is not just tools but also the ambition to position ourselves to be better prepared, to engage with challenges proactively, to respond better, to guide developments for the benefit of global public health and to throw light on areas that need more focus to move forward and catalyse innovation, especially in areas of need that are frequently neglected.

Foresight is meant to be ambitious, to provoke imagination, to think beyond today's reality to a better tomorrow and to take active steps to get there.

*Dr Soumya Swaminathan,
Chief Scientist*

World Health Organization

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Using this document

Who is this document for?

All WHO staff

This document provides guidance to all staff of WHO who plan and manage technical and operational functions. It is based on examples of good practices and methods drawn from across WHO and the literature on futures research and foresight. The document sets out a systematic approach for proactive engagement with the opportunities and challenges presented by emerging changes, new technologies and trends in our working environment.

Why should you use this document?

To be proactive about changes and stay ahead of the curve

This document provides tools to structure and inform decisions about future directions for units and teams throughout the Organization. It is designed to help teams anticipate change and adopt a forward-facing posture through structured, transparent processes for identifying how changes might affect health and health systems in countries, regions and globally. The process supports achievement of WHO's Triple Billion targets: a billion more people with universal health coverage, a billion more people protected from health emergencies and a billion more people with better health and well-being. It helps achieve that goal by identifying opportunities and challenges early, giving WHO staff time to address them effectively.

Options developed and strategic decisions formulated by using the tools suggested in this document can then be reported, with clear descriptions of how and why the priorities were identified.

How should this document be used?

To guide planning and strategy

The aim of the document is to address change actively and systematically. It begins with a brief review of WHO core functions in order to identify where foresight might help to engage with emerging change. Using five example personas, the guide illustrates how different areas of work might benefit from foresight to address the key issues they face. It guides you through a series of questions and tools for thinking about changes and their impacts. These questions and tools will help you to identify the steps in setting priorities and engaging proactively with future opportunities and challenges. The assessment of future opportunities and challenges is based on a constantly evolving evidence base. It is therefore necessary to engage in this process iteratively and to update and continuously re-evaluate our assumptions in the context of future trends, opportunities and challenges.

The document introduces a variety of tools and approaches, from simple questions to elaborate methods, to cover different ways of looking forward, anticipating and engaging with change in a flexible way.

Glossary

Anticipation

The sense of expectation of an occurrence, forecasting it and occasionally preparing for it

Assumption reversal / Reverse the negative

Workshop exercise in which participants are asked to identify their assumptions or name their most significant worries and restate them as their extreme logical opposites

Backcasting

Working backwards from the definition of a preferred future in order to determine what is necessary to make that future unfold and connect to the present. Can also be used to suggest possible early indicators for scenarios of possible futures

Black swan

A metaphor describing an extremely low-probability or unforeseen high-impact event that takes everyone by surprise; similar to [wild card](#)

Break, rupture, disruption, discontinuity

Abrupt, major change in the nature or direction of a trend or the patterns of interconnections and linkages in a system

Complex system

System made up of multiple interacting components and exhibiting emergent macro-behaviour that interact dynamically with their wider contexts; see [system](#) and [systems mapping](#) or [soft systems mapping](#)

Crowdsourcing

Use of online platforms and social media to collect a broad range of input from the public on emerging change, potential impacts, alternative futures, preferred futures or potential solutions and actions to create change

Delphi

An anonymous survey method with iterative structured feedback for pooling expert opinion on potential future events and their comparative probabilities

Driver, driving force

A major cause of systemic change that affects or shapes the future; often a bundle of related and interconnected trends of change

Emerging issue or pattern

An emerging, often novel change (indicated by a few observable cases) that could recur and mature into a new trend (indicated by a statistically significant number of cases)

Exploration

An anticipatory investigation of a wide range of possible future developments considered from a variety of perspectives

Extrapolation

Application of a method or conclusion to a new situation on the assumption that current trends will continue or similar methods will be applicable

Forecast

A statement that something might credibly happen in the future according to current knowledge, data and trends

Forecasting

The process of making a forecast

Foresight

A systematic, participatory, multi-disciplinary approach to exploring trends, emerging changes, systemic impacts and mid- to long-term alternative futures that might evolve from those changes

Futures archetype

Concise generic example of possible alternative futures derived from commonly observed patterns of change, such as continued growth, collapse or transformation

Futures study A field of study for methodical exploration of what the future might be like and people's conceptions and images of the future, especially preferred futures

Horizon scanning

A set of systematic methods for monitoring evolving change by collecting data on trends and identifying weak signals of change that may impact futures

Manoa scenario building

Narrative of alternative futures that maximizes provocative but useful differences from the present

Mapping

A process for illustrating how factors that have created the present can create the future and their interconnections; see [System](#) and [Systems mapping](#) and [soft systems mapping](#)

Megatrend

Generally, a collection of related or interconnected trends at a global or large scale

Narrative, storyline

A coherent description of a scenario (or a group of scenarios), highlighting its main characteristics and dynamics, the relations among key driving forces and their related outcomes

Narrative mapping

Collecting or crowdsourcing the narratives circulating in a community or organization on an issue of interest

Pathway

A particular trajectory in time, reflecting a particular sequence of actions and consequences against a background of developments, leading to a specific future situation. Multiple alternative pathways are determined by different perspectives, practicalities and values

Plausible or credible scenario

Scenarios judged to be reasonable because of their underlying assumptions, available data, internal consistency and logical connection to present reality

Proactive

Acting in advance of a future situation, averting undesirable futures and working towards the realization of desirable futures

Projection

An expected value for one or more indicators at a particular time in the future based on understanding of selected initial conditions and drivers

Road-map

Refers to forecasting studies, including visions and detailed projections of future developments, products or environments

Scenario

A description of how the future might unfold according to an explicit, coherent, internally consistent set of assumptions on key relations and driving forces

Scenario archetype

See [Futures archetype](#)

Simulation

Assessment of system behaviour by building and using models that are designed to behave in a manner analogous to a real system

Strategic planning

Preparation for some future state

System

A set of interconnected elements that is coherently organized into a pattern or structure; see [Complex system](#), [Mapping](#) and [Systems mapping and soft systems mapping](#)

Systemic

Relating to or affecting the whole of a system rather than just its parts

Systems mapping and soft systems mapping

Visual depiction of a system, with identification of its core components, variables, actors, interconnections, influences and the feedback loops connecting the elements

Time horizon

The furthest point in the future to be considered in a futures study

Trend

Pattern of change in a variable over time

Vision

A compelling image of a preferred future

Visioning

Creating a series of images or visions of preferred futures and desirable long-term outcomes

Weak signal

Early indicators or evidence of a potentially significant emerging change that could mature into a new trend

Wild-card event

A surprising, unpredictable event that would result in considerable impacts (or consequences) that could change the course of the future; similar to [black swan](#)

World view

The assumptions, unconscious biases, values, mental models and principles by which people perceive and interact with the world and that are often unquestioned

Executive summary

This document introduces foresight and futures thinking to the World Health Organization (WHO) as a resource for effective responses to change. Foresight is a systematic survey of developments relevant to our roles and functions that are likely to result in the greatest health, social, and economic benefits in the future.

Foresight is not about predicting the future, nor is it freeform speculative imagination. It is a structured approach to make sense of future challenges and to inform decision-making and priority-setting, taking a long-term view to make short- and medium-term decisions. Foresight also prompts us to critically assess our current assumptions and what we take for granted in a context of evolving change.

Most simply, foresight focuses our attention on change and its impacts over time. Foresight assists us in thinking critically and systemically about change and its implications, both emerging risks and emerging opportunities. It helps reduce blind spots regarding potential changes and impacts. It widens our sense of the positive potential of the future; foresight helps us to understand how much more we can ask of the future in setting our goals and imagining better futures. Foresight can be thought of as a set of reflective questions, which are explored below.

Through interviews and discussions with a contrasting variety of WHO staff members and external advisers, we distilled a selection of foresight activities that might be most relevant to WHO. WHO staff address a wide range of challenges in public health, health systems, medicine, health products, medical technology and disease. Concentrating on typical WHO functions and evolving needs helped us to identify the specific foresight concepts and methods that would add value to each of these functions. We identified activities for structuring and engaging in foresight and what those activities might be for individual WHO staff members day to day. What simple steps could help to get started with foresight? The six steps that emerged as good places to start were identifying changes, considering and including different perspectives, exploring impacts, mapping interdependences, identifying change agents and communicating insights.

Foresight comprises a wide variety of theories, frameworks, methods and processes drawn from over 50 years of conceptual development and applied practice, which are extensively documented in the peer-reviewed literature. This document presents a selection of tried and tested approaches to help WHO staff begin to apply foresight. This is a basic introductory guide to engaging in foresight exercises, from simple questions to much more sophisticated (and resource intensive) methods to serve different needs.

Social change, technological and scientific advancement and innovation are characterized by complex, dynamic interactions, serendipity and inherent unpredictability. Limits to knowledge require continuous re-evaluation of options and strategic choices. Foresight enables us to respond more rapidly and rigorously to upcoming changes that overturn our assumptions and current ways of working.

Introduction

Foresight consists of a set of methods and tools for better understanding the emerging trends and changes that might affect our work. Foresight opens space for thinking about new opportunities and possibilities, taking a longer-term perspective and offering a mechanism to construct, frame and articulate needs and priorities.

Foresight is based on a systematic survey of developments relevant to our roles and functions that are likely to result in the greatest health, social and economic benefits in the future. Foresight is not predicting the future, nor is it free-form speculative imagination. It is a structured approach to make sense of future challenges and to inform decision-making and priority-setting, taking a long-term view as a basis for short- and medium-term decisions. Foresight also prompts us to critically assess our current assumptions and what we take for granted in a context of evolving change.

The aim of this document is to equip WHO staff at all levels and the Organization as a whole with tools to engage with the future in order to anticipate both emerging and potentially disruptive developments as well as opportunities in ways that are tailored to different needs and circumstances.



WHO context

WHO strives to remain “ahead of the curve” in relevant areas of research, science and technology in order to proactively identify, anticipate and shape issues that hold promise for prevention, diagnosis and treatment. The Global Health Foresight function was established in the WHO Science Division for this purpose and to assist Member States in building “futures thinking” into their strategic health planning.

Advances in science and technology hold great promise and hope for new, improved ways to address global health and ensure healthier populations worldwide. Science and technology have undisputed roles in working towards achievement of the triple billion targets of the WHO 13th General Programme of Work.

This guidance document introduces tools and approaches for engaging in foresight in an easy-to-access way for staff throughout the Organization.

The Global Health Foresight function in the Science Division seeks to:

- strengthen capability for early identification of trends or advances in science and technology that will notably impact the future of public health;
- accelerate WHO guidance to Member States on the governance and development of emerging technologies related to health;
- generate country foresight and scenarios through structured, transparent processes that help identify how those trends might affect health and health systems in countries; and
- provide information on strategic options for preparing health systems to take advantage of opportunities and proactively confront risks and challenges as a basis for global health policy.

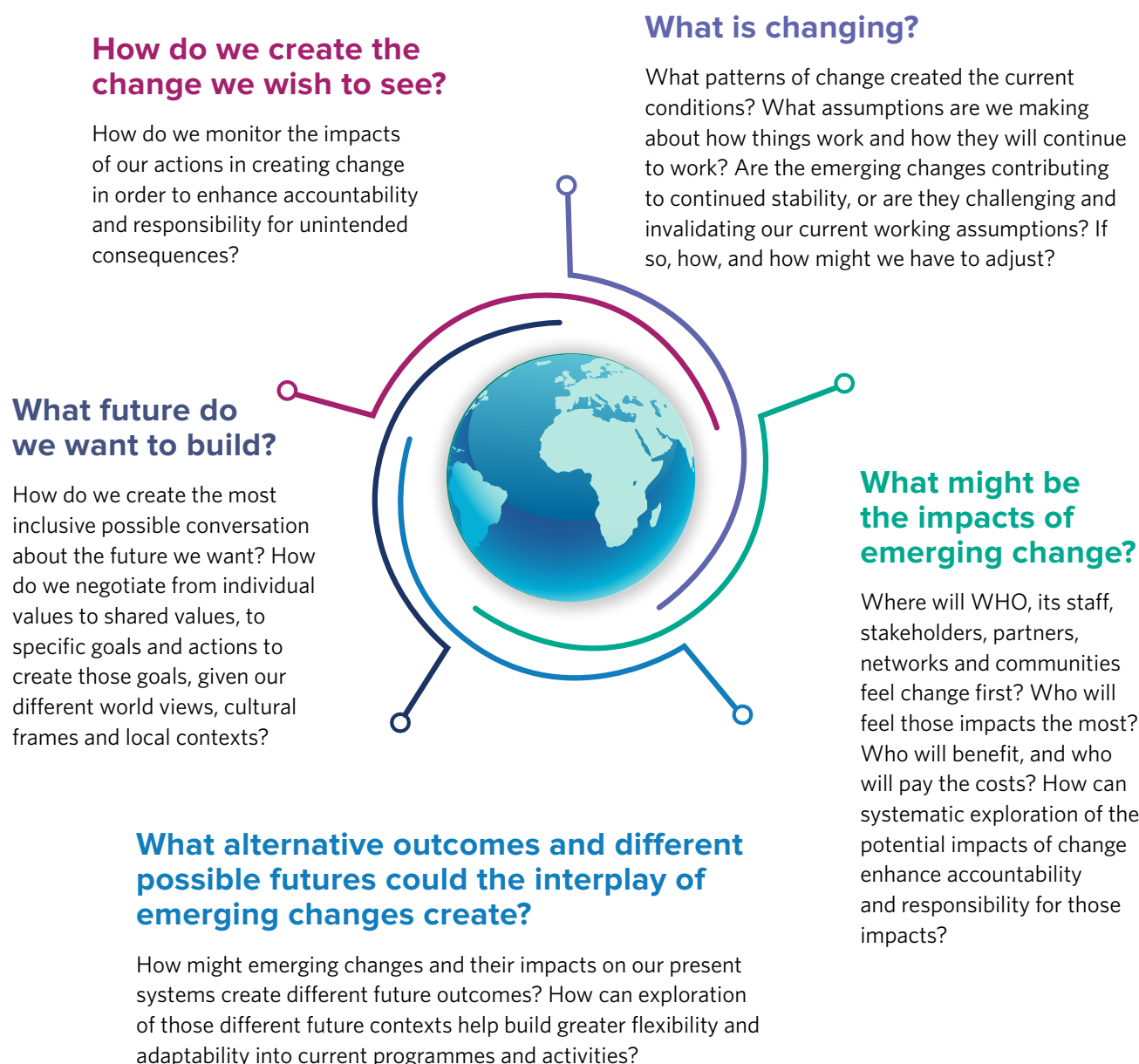


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What is foresight?

Most simply, foresight focuses our attention on change and its impacts over time. Foresight assists us in thinking critically and systemically about change and its implications for both emerging risks and emerging opportunities. It helps reduce blind spots about potential changes and impacts. It widens our sense of the positive potential of the future; foresight helps us understand how much more we can ask of the future in setting our goals and imagining better futures. Foresight can be thought of an interconnecting set of five reflective questions (Fig. 1):

FIGURE 1 Areas for reflection in a preliminary foresight exercise



Mental shortcuts and biases

Thinking about the future and planning ahead are everyday activities; however, there are a number of pitfalls. When we think about the future, we are imagining what might happen according to our experience and judgements. Imagined futures are speculative and shaped by our values, assumptions, world views, biases and uncertainty.

Rigorous futures thinking and foresight approaches are designed to manage those biases and to challenge current assumptions. All futures thinking begins, in essence, by considering what would happen if change overturned everything we thought we knew to be true. To answer that, you must first explicitly identify what it is you think you know to be true; what do you assume will always be true? Most importantly, how do your assumptions and understanding differ from those of the person next to you? From those of people in other communities? How does change challenge everyone differently, and how can we build on differences to adapt more successfully and more justly to change?

Foresight provides a framework for exploring future scenarios systematically. For a robust, accountable basis for planning, we must acknowledge and address the uncertainties and biases that influence our judgements.

Gut feelings and intuitions, or cognitive biases, are mental shortcuts necessary to process and interpret information efficiently. Often, these shortcuts lead to systematic errors that can significantly skew decisions and judgements. Many biases are well known, such as “group think”, in which the desire for group harmony dissuades dissent and leads to bad decisions, or “confirmation bias”, in which one welcomes information that confirms one’s preconceptions and rejects information that does not.

OPTIMISTIC BIAS

- Tendency to underestimate negative and overestimate positive consequences
- Overconfidence in one’s ability to foresee all possible future modes

SENSITIVITY TO PRESENTATION

- Perception shaped by how something is expressed in terms of gains or losses
- Choices influenced by how outcomes are partitioned

HEURISTICS (MENTAL SHORTCUTS)

- **availability:** information that is readily available is more easily recalled and skews judgement
- **representativeness:** similar events or things grouped on the basis of preconceptions
- **anchoring:** starting points influence final results

GROUP BIAS

- Consensual groups exaggerate initial optimism or caution and increase confidence in opinion. Dissonant groups can be more accurate.

Acknowledging biases allows us to address the values, judgements and assumptions inherent in each scenario. Bringing in a variety of diverse perspectives ensures even-handed exploration of various alternative scenarios. Rather than trying to reduce our model of the future to a single, definitive prediction, the value of foresight is the introduction of alternative perspectives that illuminate a range of options.

Plural and conditional approaches cannot overcome uncertainties, psychological predispositions or group dynamics; however, explicit acknowledgement of influences, assumptions and biases can make appraisal of options and future directions more rigorous, robust and accountable.

What value does foresight add to our work

WHO's vision is structured on three interconnected strategic priorities to ensure healthy lives and well-being for all at all ages: achieving universal health coverage, addressing health emergencies and promoting healthier populations. The Organization's role in providing global public goods that help to ensure health for all people within and across national boundaries has never been more relevant. WHO's unique status as an organization that sets globally applicable norms and standards makes it vital in a rapidly changing world.

Foresight tools can make a critical contribution to WHO's ability to fulfil its vital roles in a dynamic environment in a timely fashion. These tools and approaches can enable and empower staff to better anticipate, respond to and adapt to rapid changes and to improve people's health, address health determinants and respond to health challenges.

On one level, futures thinking and strategic foresight are a matter of asking good questions: critical questions, systemic questions, creative questions, provocative questions. Consideration of those questions helps to explore the possibilities inherent in emerging change. On another level, futures thinking requires rethinking our assumptions and mental models: it requires that we challenge what we take for granted in the present in order to prepare for change in the future.

Change can emerge anywhere; therefore, futures thinking requires us to think across sectors and disciplines and bring in different perspectives. Moreover, it requires us to proactively scan the horizon and to filter, order and integrate emerging and existing trends and data. This can increase the creativity of our analyses and searches for solutions and foster broader situational awareness.

The impacts of change will affect different communities and different localities in different ways. In order to account for the range of potential impacts, we must embrace diverse perspectives and engage with marginalized or silenced voices to explore potential impacts fully and to address both the intended and the unintended consequences inclusively.

The resulting landscape of dynamic change to which we must adapt continuously is highly uncertain. Foresight helps to confront those uncertainties by exploring alternative possible futures. The importance of anticipating change is illustrated in Box 1.

BOX 1 Importance of anticipating change

Novel technologies have frequently blindsided organizational responses, regulatory discourse and, consequently, proactive engagement with their implications. The emergence of genome-editing nuclease technologies is a good example. The CRISPR-cas9 system is a powerful means for making targeted genetic modifications and is applicable to virtually any organism. Site-specific genome editing, and the CRISPER-cas9 system in particular, did not burst onto the scene out of nowhere: it emerged gradually and diffused over time.¹

A trend towards simpler, easier-to-use genome editing could have triggered more profound consideration of the normative and ethical implications before its widespread adoption, including its controversial application to

human germline editing, not to pre-empt or predict but to closely accompany the development with timely normative guidance and responsive standard-setting frameworks.

The question is therefore whether governance actors and policy-makers could have picked up the signals earlier and acted on them? Would it have been possible to separate the noise from the signal at early stages of development and diffusion to recognize the potential implications?

With hindsight, yes. There were signals and trends that indicated development in this direction.²

The tools presented here cannot predict the future but can perhaps help us to recognize signals early and to act proactively on their implications.

¹ Mojica FJ, Montoliu L. On the origin of CRISPR-Cas technology: From prokaryotes to mammals. Trends Microbiol. 2016;24(10): 811-20.

² The expectation that the outcome of this development could have been anticipated is particularly prone to hindsight bias – the expectation that a particular development could have been predicted with some certainty after the fact. See: Tversky A, Kahneman D. Judgment under uncertainty: Heuristics and biases. Science. 1974;185(4157):1124-31; and Fischhoff B, Beyth R. I knew it would happen: Remembered probabilities of once-future things. Organ Behav Hum Performance. 1975;13:1-16.

Foresight in WHO

WHO's principal focus is promoting health rather than merely fighting disease and especially improving the health of vulnerable populations and reducing inequity. The Organization's roles and functions vary, and WHO staff address a wide range of challenges. As WHO's mandate touches on virtually all aspects of life, its roles and functions must be dynamic and responsive, as socioeconomic, political, cultural, environmental and economic forces continue to drive changes in the burden of disease and healthy life expectancy.

Concentrating on common WHO functions and the evolving needs helps us to identify what specific foresight concepts and methods would add value to each of these functions. We identified six key areas (see Box 2).

BOX 2

Six areas in which foresight would be particularly valuable

- identifying emerging change – *keeping an eye on what's new*
- thinking about patterns of change over time – *mapping how systems evolve*
- recognizing where change generates costs and benefits – *exploring impacts*
- engaging with communities and populations that are often unheard or invisible and listening to their perceptions of change and its impacts – *understanding differences and neglected needs*
- creating exploratory stories of possible future outcomes or scenarios – *preparing proactively for different future environments*
- *boosting innovation and new approaches*

How are these six areas related to WHO's work?

How can we integrate foresight to address specific WHO staff responsibilities?

*In this section, we look at **foresight activities** in the context of WHO and use different scenarios to explore how to make good use of **foresight tools** and **futures thinking**.*



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Core foresight activities in WHO

Below, we explore the role of each of the six foresight activities and key questions and features of the activities and illustrate them with fictional persona. Each describes the range of challenges that WHO staff might face and ways in which foresight approaches might help to address those challenges.

KEEPING AN EYE ON WHAT'S NEW



Scanning the landscape of change is the foundation of foresight. Formal horizon scanning assists in identifying emerging signals of change and assumes ongoing monitoring of changes as they mature into trends. Scanning is a formal research activity, and teams can add depth to their desk-based scanning by curating interesting social media feeds and blogs, setting up interactive workshops and focus groups, interviewing interesting people or crowdsourcing identification of emerging change via surveys and participatory platforms. Answering the “so what?” question about change is the next step: What might be the impacts of the emerging change? Do they matter?

MAPPING HOW SYSTEMS EVOLVE



It helps to remember how our communities and systems have changed over time. What were the patterns of change? How did we do things in the past? How do we do them now? If we draw a map of the public health systems and crisis responses of 50 years ago, what would it look like? If we draw a system map of the situation today, how is it different? What components or actors have disappeared? What new ones have emerged? What connections have disappeared, and what new ones have emerged? Where are there gaps? How have patterns of external events changed? Understanding the systems in play and how they have evolved – and are still evolving – helps to identify where trends and emerging changes might transform or disrupt what we take for granted.



RENATO

Renato is working on prevention of noncommunicable diseases. He must stay on top of global and local trends that affect health and track important and useful improvements in preventive measures, strategies and behavioural insights to support their implementation. Some innovations may impact marginalized communities negatively. A challenge is monitoring complex contextual problems that affect health issues and accounting for potential impacts and interconnected implications.



HOW CHANGE CHALLENGES ME:

“We work with vulnerable populations and communities; as their environment worsens, their health does as well. Global trends can create local challenges, and local trends can make or break a community’s ability to respond. I need to track the changes that contribute to noncommunicable diseases and new ideas and developments to address them and consider how innovations work in practice in different places.”

HOW FORESIGHT HELPS

Resources on global trends can provide a springboard for conversations and research. A group could be set up to share interesting news items, or a journal club could be established, with relevant publications scanned by a team and weekly meetings to review and discuss potential impacts and implications. Conversations are critical to bringing more people and perspectives to the table. Crowdsourcing ideas and stories about changing health challenges from local communities can generate vital insights and engagement.

EXPLORING IMPACTS



Both explicit mapping of systems and embracing inclusivity are used in exploring the potential impacts of change. A comprehensive, inclusive approach increases the likelihood that surprises, both good and bad, will be anticipated. Foresight reminds us that trends, emerging changes, uncertainties and wild-card events collide, interconnect, interact, transform each other and generate fresh change. How do interacting changes affect different systems? How do changes interact differently in different communities or in different cultural or environmental settings? How are different governments responding to change: Are they regulating it, supporting it, suppressing it? The more we explore how change cascades through the systems of the world and how different communities and localities experience it, the better we will understand the range of futures we might face.



ELHAM

Elham coordinates delivery of essential health services in health emergencies and building emergency response capacity. Optimizing organizational preparedness requires identification of local resources and the capacity to assess needs to ensure effective delivery of vital health services.

HOW CHANGE CHALLENGES ME:

“We need to know where emergencies might arise and where a problem could tip into a more serious challenge. Different local conditions create different outcomes. Mapping local vulnerabilities and connecting them with global shifts can help us understand evolving vulnerabilities in local health systems and resources.”

HOW FORESIGHT HELPS

A pilot project was conducted in which local communities were asked to map their health systems and identify the actors or organizations linked to different parts of the system. What are their current resources? What challenges do they currently face? What do they think their vulnerabilities are? Research on emerging changes and the associated risks provides a basis for asking communities about the effect of those changes locally. Would they tip the system from vulnerability into catastrophe? Would the changes contribute to specific challenges, for example access to food and water or increased risks of wildfires, landslides or flooding? How well could the local health system respond before becoming overwhelmed? What additional resources would be required by specific local health professionals?

UNDERSTANDING DIFFERENCES



Evolving patterns of change and the systems affected look different from different perspectives and in different contexts, whether political, economic, demographic, cultural, infrastructural or environmental. Understanding differences allows identification of who benefits and who is left behind. Critical, rigorous foresight requires contrasting points of view that acknowledge and engage people and elements that are too often unheard and unseen. Truly inclusive processes reduce blind spots in anticipating unintended consequences and emerging changes; equally importantly, they amplify our creativity and resilience in contexts of change.



AURELIO

Aurelio promotes intersectoral approaches to health. Understanding changes in the multilateral environment and anticipating shifts in the geopolitical environment allow him to assess if and how changes affect WHO's ability to engage effectively with various stakeholders.

HOW CHANGE CHALLENGES ME:

“As nations respond to the turbulent situations the pandemic creates, relationships are shifting. Governments are experiencing stresses differently and changing their expectations and demands on international agencies in consequence. This can in turn create unexpected changes in our relationships with partners and stakeholders.”

HOW FORESIGHT HELPS

Use of existing foresight networks of international and regional organizations allows monitoring of change and consideration of how global changes are affecting policies. Sharing insights with external partners can indicate how emerging changes might affect interregional or international relations or the relations among different international organizations and agencies. Working groups of interested colleagues can map interconnections and relations among key players and explore how various changes shift policy priorities and demands between them and with us.

PREPARING PROACTIVELY FOR DIFFERENT FUTURE ENVIRONMENTS



Acknowledging that the future holds many possibilities and that your city and my community and someone else's island may all experience those possible futures differently assists planning today. The challenges of many possibilities demand creative responses. Thus, imagining alternative futures and then imagining how to work most effectively in those new environments helps drive innovation. Reviewing our current approaches to work and our strategies for reaching goals in the conditions they might face in different futures helps to make our work, our systems and our strategies more resilient in a context of uncertain, turbulent change.



MARICA

Marica facilitates research integration and communication. The fragmentation of the information landscape and coordinated, targeted use of disinformation complicate her work significantly. She wants to stay up to date with new approaches and improve communication of evidence, research and critical issues.

HOW CHANGE CHALLENGES ME:

“We’re always fighting against misinformation and disinformation. Our reports are competing with an avalanche of false information. We need our results to have an impact, to help people think about the realities of the changes and choices they should make as individuals.”

HOW FORESIGHT HELPS

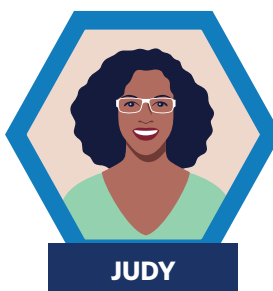
Workshops for researchers in various disciplines can explore what futures might emerge and find the interconnections among issues. How might those intersections play out in health systems? In political or economic systems? In people's daily lives? Highlighting the impacts and consequences in context helps to make findings tangible.

In games and virtual environments, people can be asked to imagine how they would respond to various health issues, challenged to negotiate trade-offs in allocating resources and see the impacts. Interaction with issues helps to make research concrete and relatable.

BOOSTING INNOVATION



Creativity itself feeds on change. The stimulus of the new can prod the imagination to see new approaches to problems, see new ways of doing things and use the discoveries and inventions of others as new building blocks to create novel solutions to both longstanding and emerging problems. Horizon scanning provides a stock of new ideas and emerging changes. Descriptions of alternative possible futures helps boost innovation by challenging our implicit assumptions and biases and demanding that we think beyond what we take for granted and the status quo.



JUDY

Judy works on antimicrobial resistance and must cope with a rapidly changing scientific and technological landscape. Various advances in science and technology could transform drug development incentives to meet critical unmet needs. She needs a rigorous, inclusive approach to monitoring emerging changes in this area and their potential effects.

HOW CHANGE CHALLENGES ME:

“How can we monitor emerging changes rigorously and systematically and consider who might be affected and what the implications are? Questions of ethics and the potential consequences of new discoveries and innovations are also critical.”

HOW FORESIGHT HELPS

There are various ways of scanning the landscape – online sites track university press releases and emerging scientific discoveries and innovations. A group could be set up to share interesting news items, or a journal club could be established, with relevant publications scanned by a team and weekly meetings to review and discuss potential impacts and implications. A simple shared record of the most interesting items identified, references and potential impacts can help to identify emerging patterns and changes to feed into ongoing work and recommendations.

Start using foresight – simple steps

How do those core foresight activities translate into individual action and daily practice on the ground? Every person engages in foresight every day, even if implicitly. A shift to foresight in an organization starts by making futures thinking explicit. What are simple steps that every WHO staff member and their network partners could adopt to start looking ahead and challenging their assumptions in order to innovate and act with resilience? Here are six starter steps.





01

KEEP YOUR RADAR AND SONAR SWITCHED ON

Keep your eyes on the horizon and your ear tuned to stories and signals of change.



02

BREAK BOUNDARIES

Ask colleagues from other disciplines for their perspectives; ask someone from a different country, community or culture for the local perspective on the issue and on what changes might affect it. Ask someone who has never been asked about the issue, and include them in the discussion; find usually invisible and unheard stakeholders.



03

EXPLORE OUTWARDS AS FAR AS YOU CAN

Pick a potentially transformative or disruptive change, and map its potential immediate impacts. What are the intended consequences? What might be some unintended consequences? Think through the impacts of the impacts. Cascade your explorations to potential secondary and tertiary impacts. Where do unexpected impacts arise? Who do they affect? What are the surprises? The disruptions?



04

MAP INTERDEPENDENCES

Get your colleagues together for informal discussion, sketch out a systems map of an issue you are currently addressing. Brainstorm all the emerging changes you think might be relevant to that issue. Where are they on the map? What impacts do they create, and what do they disrupt? What do they transform? What new opportunities do they create?



05

IDENTIFY EXISTING ALLIES FOR CHANGE, AND MAKE NEW ONES

Who is tracking and addressing the same changes you are? How are they working to adapt to, mitigate or amplify changes? How can you collaborate? Who constrains change, and how can you help them to adapt?



06

MAKE THE DIFFERENCES VIVID

Tell the stories of innovations, new solutions and emerging challenges by making them real as lived experiences. What's the new narrative, what's a day like after the changes hit? What artefact represents this new capability?

The choice of appropriate foresight tools depends on the resources available. For example, if the only resource available was a shared lunch meeting with colleagues, what questions could prompt useful discussions? Or, if time and budget allowed for a workshop, what participatory foresight tools could address the challenges and issues a staff member faces in a scenario? If the resources could support a foresight project, what methods and approaches might the staff member use? What tools might be useful for dealing with uncertainties and finding ways to set priorities and open up spaces to encounter the challenges proactively?

The boxes below illustrate three different resource settings, in which the choice of tools and approaches must be tailored to the needs and context to which foresight is applied. The suggested tools and methods are explained in greater detail in Annex 1.

DIFFERENT FORESIGHT ACTIVITIES, DEPENDING ON RESOURCES

A discussion | no resources

Simple steps and questions to create insight

KEEP YOUR RADAR AND SONAR SWITCHED ON

What are the current major trends that could affect this issue?

BREAK BOUNDARIES

Consider various viewpoints – of artists, teenagers, people who are challenging the scientific paradigm, inventors, marginalized communities, activists.

What do different communities see as the emerging changes that could transform health and wellness?

EXPLORE OUTWARDS

What are the *intended* consequences of the changes?

Who benefits?

What are the *unintended* consequences of the changes?

Who is affected?

What are their impacts and costs?

MAP INTERDEPENDENCES

Pick three emerging changes. How do they interconnect?

Do they amplify each other, or do they balance each other out?

How do their impacts interconnect, and who feels them first?

IDENTIFY ALLIES FOR CHANGE

Who else thinks this is a priority and why?



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A workshop | *limited resources*

Host a workshop to explore relevant changes

- *Extract* changes from existing horizon scanning projects for monitoring global issues.
- *Explore* potential long-range change by mapping the potential primary, secondary and tertiary impacts of changes.
- *Consider different mindsets* for encountering change:
 - *managerial*, focused on stability;
 - *visionary*, driving transformative change;
 - *entrepreneurial*, implementing new policies, products or services.

What do participants identify as current system components and interconnections and current operating assumptions?

What do they take for granted?

What are their underlying paradigms, values and world views?

What changes are they seeing in the world?

What actions are they taking now to create change?

Examine how the impact of multiple trends interconnects in different contexts.

Analyse interconnected changes that amplify impacts and those that balance and dampen impacts.

Explore how relations might shift in response to change and emerging crisis by *playing out possible futures*.

Emerging issues analysis, horizon scanning, futures wheels, Manoa scenario building, three-horizons framework, causal layered analysis



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A project | *dedicated funding*

Invest in ongoing horizon scanning to identify emerging drivers and signals of change.

Start by *compiling* the most *relevant changes* from existing horizon scans.

Build up a system map of trends and emerging changes that illustrates where they interconnect.

Identify where interconnections among trends might accelerate or amplify changes in some areas while blocking changes in others.

Map impacts and *impact cascades* to assess how resulting patterns of change will affect particular communities or regions, and how those changes affect current systems and interconnections.

Reflect critically on the cultural structures underpinning current thinking on an issue to identify the “unthought” in current analyses, and look for changes that might challenge *our current working assumptions*.

Extend that effort with *stakeholder analyses* and focus groups, workshops or crowdsourcing to identify which stakeholders are affected by consequences and who may benefit.

Identify how changes might *challenge or invalidate current working assumptions* and where that might cause tensions among partnerships and coalitions.

Horizon scanning, systemic impact mapping, cross-impact analysis, causal layered analysis, emerging issues analysis, assumption reversal, stakeholder analysis



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Quick start guide

This section provides questions to start discussion of the basic reflective questions introduced above.

<p>FRAMING – STARTER QUESTIONS</p> <p>What's the issue?</p> <p><i>What issue, question or problem is on your mind?</i></p> <p><i>What future-proof solutions do you need most?</i></p>	<ul style="list-style-type: none"> → What is the wider context of your issue? → What does it connect to or influence? → Who else thinks this is a priority, and why? → If left to itself, would it naturally get worse or get better? → What is it most likely to disrupt?
<p>AWARENESS OF CHANGE – STARTER QUESTIONS</p> <p>What is changing?</p> <p><i>What patterns of change created the current conditions?</i></p> <p><i>What assumptions do you make about how things work and how they will continue to work?</i></p> <p><i>Are emerging changes contributing to continued stability, or are they challenging and invalidating our current working assumptions?</i></p> <p><i>If so, how, and how might we have to adjust?</i></p>	<ul style="list-style-type: none"> → What do you think could never change or would never happen regarding this issue? → Are there any emerging signs that it might? → What are the current major trends that you think could affect this issue? → What do outliers and people who are often unheard – those challenging scientific paradigms, inventors, people in marginalized communities, activists, artists, adolescents – suggest are emerging changes? → What single change would most transform or disrupt this issue? Is there any sign that change is emerging? → Are any of the systems adjacent to this issue under stress? → Are there any signs that they are tipping into runaway growth, collapse or chaos?
<p>IMPACTS OF CHANGE – STARTER QUESTIONS</p> <p>What might be the impacts of emerging change?</p> <p><i>Where will WHO, its staff, stakeholders, partners, networks and communities feel the change first?</i></p> <p><i>Who will feel those impacts the most?</i></p> <p><i>Who will benefit, and who will pay the costs?</i></p> <p><i>How can systemic exploration of potential impacts of change enhance accountability and responsibility for those impacts?</i></p>	<ul style="list-style-type: none"> → Pick an emerging change that you think is interesting. What are its immediate impacts? What will they be? → What are the intended consequences of the change? Who benefits? → What are the unintended consequences of the change? Whom do they affect? → Pick three emerging changes that you think are interesting. How are they interconnected? Do they amplify each other or balance each other out? How are their impacts interconnected? → Ask a group of diverse stakeholders to draw a soft systems map of the issue. Where will the trends or emerging changes you have identified hit it first? What will they disrupt or transform as they ripple through the system, in terms of relationships, connections, people, resources or activities?

EXPLORING ALTERNATIVE POSSIBLE FUTURES – STARTER QUESTIONS

What alternative outcomes and possible futures could be created by the interplay of emerging changes?

How might emerging changes and their impacts on our present systems create very different possible future outcomes?

How can exploration of those different future contexts help to build greater flexibility and adaptability into current programmes and activities?

- What do you assume the future will look like? Why? How many other people assume that future?
- What are the possible outcomes of your issue – alternative futures – that people are already discussing?
- What would be the most surprising outcome for your issue? How would you respond? What would you look for as signals that it might occur? Do you see any of them now?
- What would be the worst-case outcome for your issue? How would you respond? What would you look for as signals that it might occur? Do you see any of them now?
- What could never happen? What assumptions would have to be overturned? What constraints would have to disappear?

ENVISIONING PREFERRED FUTURES – STARTER QUESTIONS

What future do we want to build?

How can we create the most inclusive possible conversation about the future we want?

How can we negotiate from individual values to shared values, to specific goals and actions to create those goals, given our different world views, cultural frameworks and local contexts?

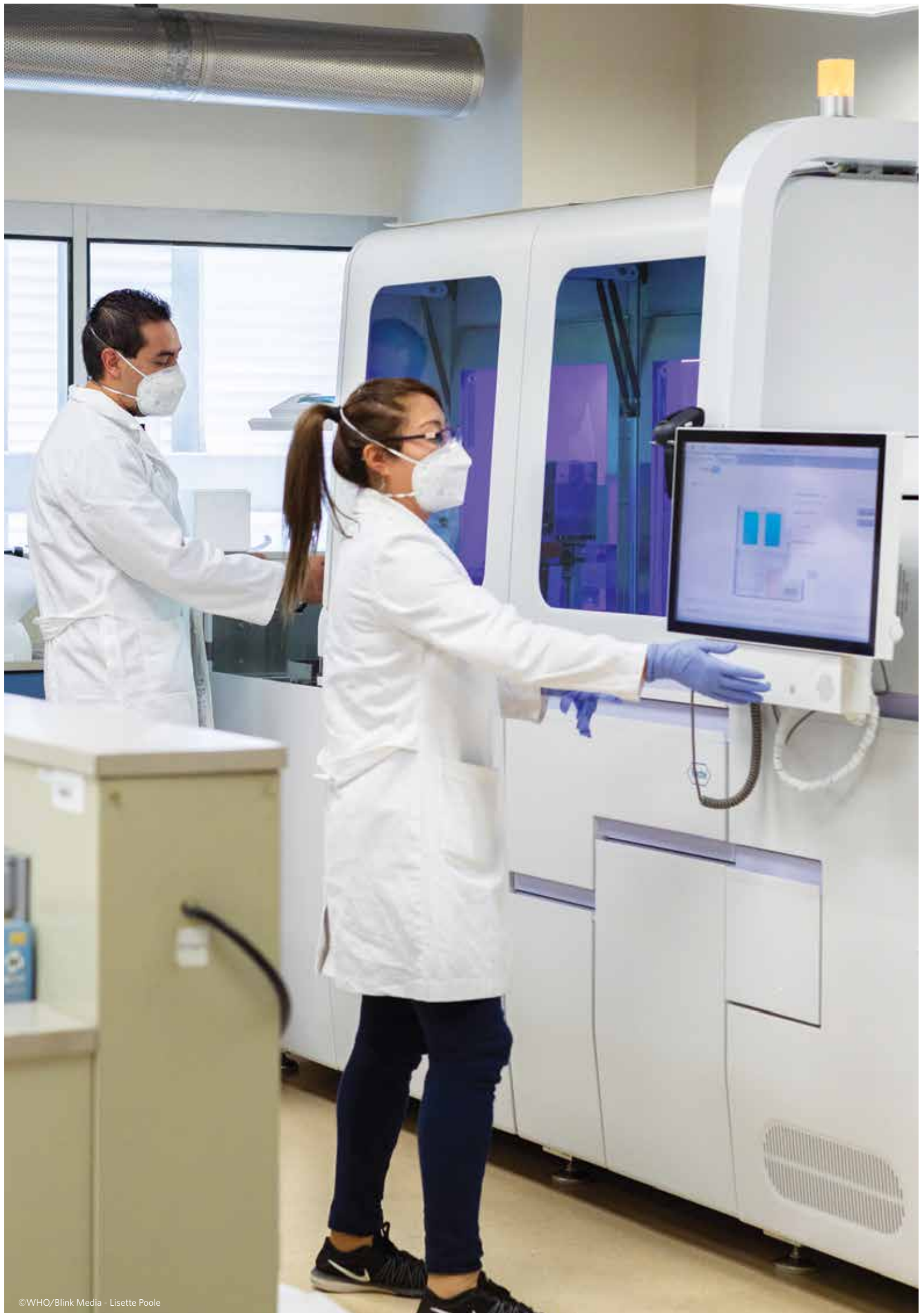
- What are your deepest concerns or worst fears about this issue? If you reverse them and restate them as their polar opposites, does the result express your best hopes? Be specific. What else would complete your list of best hopes?
- What are the values relevant to this issue that people most deeply cherish? Have a conversation and bring everyone into it. Let those who are least often heard and seen start first. How would systems based on those values be different from those today?
- If there was one thing you could change first to transform the issue for the better, what would it be?
- What do the next generations need from us to transform the world into a better place?
- What story do you hope that your grandchildren will tell about how you championed change?

CREATING CHANGE – STARTER QUESTIONS

How can we create the change we wish to see?

How should we monitor the impacts of our actions in creating change in order to enhance accountability and responsibility for unintended consequences?

- Can you identify immediate allies in transformation? Who shares your understanding of the issue and your goals for a better future?
- How can you bring more people in to identify the details of your preferred future? Who else should join the conversation? How can you support a growing community of action?
- Who is most likely to block movement towards your desired outcome? Why? What additions to the vision might make this preferred future positive for them or at least ensure that it is not a loss?
- What story or stories best communicate the imperative for change and the shape of the desired future? What are the different ways in which can you express those stories: lectures, games, role-play, artefacts, exhibits, blogs, memes, presentations, videos?
- What are your 15% solutions: What could you do today with only 15% of your time or resources (or less!) to shift change in the direction of your desirable future?



Foresight in WHO – examples

WHO colleagues are already engaging in foresight and applying futures thinking. The following pages offer examples from the perspective of units engaged in initiatives to monitor emerging changes in science and technology, to look ahead to confront new infectious hazards, explore the potential for health system transformation and extend WHO's capacity to scale up innovative technologies where they are needed most.

The aim of the WHO global health foresight function is to inform decisions about innovation, development and emerging science and technology, shape development, diffusion and adoption of health innovations and proactively identify emerging problems and challenges.

Global health foresight

What are the most impactful, plausible, novel issues in global health and health care over the next two decades? What are the potential risks and concerns arising from those developments? How are these issues interrelated, and how can global health governance respond to scenarios related to them?

WHO global health foresight function

The WHO Science Division in 2020 established a global health foresight function to assist WHO and its Member States in engaging in futures thinking and building it into their strategic health planning.³ The foresight function, in the Research for Health Department, is designed for systematic exploration of developments in science and technology relevant to global health. The Department brings together a number of functions to address the research cycle comprehensively, from monitoring emerging technologies to setting research priorities by identifying gaps and promoting and supporting research according to the greatest unmet needs, placing ethics at the heart of decision-making and providing governance options and leadership in country-oriented research policy and scaling up options to translate innovation into impact and bring evidence to policy.

A variety of technological foresight approaches are being developed to identify trends and issues in public health, develop scenarios, consult in workshops and with Delphi techniques and open space for examining technological opportunities.

Horizon scanning

To date, our expert-led horizon scans have identified about 30 emerging technologies and socioeconomic issues that merit close attention. The work also highlights critical issues and supports ongoing engagement in, for example, responsible use of life science research, addressing potential misuse, the ethical implications of use of artificial intelligence in health care and the governance and oversight of genome editing.

Capacity-building

Through wider engagement throughout the Organization in forward-looking exercises, foresight can train more focus on the longer-term future and a degree of consensus on desirable futures and enhanced communication and coordination among the different parts of the Organization. In itself, facilitating networking and information flows is an important goal of foresight.

To ensure wider use of foresight approaches, the global health foresight function will build capacity throughout the Organization by providing training, outreach and awareness-raising. This document provides a starting-point for use of relevant approaches and methods.

³ For more information and contacts, see: WHO Foresight – Monitoring emerging technologies and building futures-thinking. Geneva: World Health Organization; 2022 (<https://www.who.int/activities/monitoring-emerging-technologies-and-building-futures-thinking-who-foresight>).

Information network for epidemics and foresight for infectious hazards

Can foresight improve pandemic preparedness?

There will be another pandemic. The question is not if but when. Uncertainty is one of the characteristics of pandemic events: we do not know which pathogen will cause the next pandemic, just as we do not know which factors will drive the spread and the impact of the disease on populations and economies, the severity of the disease, whether it will cause widespread mortality or if it will stress health systems to the point of collapse. These uncertainties cannot be known before the next pandemic.

Almost 2 years after identification of the novel coronavirus that is causing the COVID-19 pandemic, reviews and lessons learnt are allowing us to look back and reflect on our actions and their outcomes over the course of the pandemic so far. To find our way to a healthier future, however, we must move beyond reflection.

Preparations are being guided by failures in addressing the latest pandemic, hoping that we will be better prepared for the next one, solely by addressing problems already faced. Unfortunately, the next pandemic may be very different. We will be caught by surprise if we don't imagine a number of different, plausible future scenarios.

WHO applies foresight in the area of pandemic and epidemic preparedness in a structured, interactive process to create a space for us to ask, "What are the possibilities, and how can we chart a different course?". Foresight is not forecasting, a prediction tool or projection based on mathematical modeling. It is an intellectual exercise that is accompanied by empathy in imagining the future to define the players and actions necessary to ensure the future we want. The foresight approach, based on well-established methods, consists of analysing the megatrends that influence the present and developing plausible scenarios for the future according to the combination and varying intensity of those trends.

In July 2021, WHO and partners began imagining the future of infectious threats. The Infectious Hazards Foresight Initiative brings together world leaders and influencers in a variety of disciplines to consider the global trends that are affecting the emergence and course of the COVID-19 pandemic and to discuss its future, as well as that of other infectious threats in the next 3–5 years. The aim of the Initiative is thus a collective appraisal of the risks ahead and of solutions to either prevent the worst-case scenario or foster preventive actions to realize the best-case scenario. The time horizon is relatively short, 3–5 years, so that the outcomes of this exercise can be used and translated into action immediately.

The three aims of the Initiative are to:

- facilitate a global debate on plausible scenarios;
- identify threats, opportunities, risks and innovative solutions to strengthen epidemic and pandemic preparedness; and
- shift from a reactive to a proactive approach to address infectious threats.

Process and method

Three tools are used in the Infectious Hazards Foresight Initiative.

1 Horizon scanning

The process started with a horizon scan of signals and trends that are shaping the future of infectious hazards. The scan built on the institutional knowledge of WHO and research (literature review) to identify signals, megatrends and key factors that are likely to drive the course of a pandemic or epidemic. Broader searches and validations were conducted by foresight professionals. The social, technological, economic, environmental and political (STEEP) framework was used to consider wider issues. A qualitative assessment produced a list of 30 high-impact trends that represent the ecosystem of change within which futures are explored. Likely impacts were assessed for the time horizon of 3–5 years.



2 Scenario development

WHO and partners developed hypothetical scenarios for considering signals, megatrends and key factors identified during the horizon scan. The initial scenarios were challenged by professional futurists and reduced to four. In the next step, possible permutations and variations of the key factors were used to make projections, aided by artificial intelligence-powered software. A narrative was constructed for each of the four scenarios to offer a perspective into daily life in each.

3 Expert workshops and round-tables

Diverse perspectives are brought together in expert workshops and public round-tables. These offer opportunities to challenge, refine, strengthen and expand each scenario, outline implications, identify key actions and discuss the role of leadership.

Applying foresight

The scenarios were an invitation to imagine, discuss and debate the future, with the aim of translating imaginary into concrete actions. Collective deliberation in an environment that emphasizes creativity and pragmatism promotes innovative solutions. The foresight exercise allowed use of our ideas and creativity to explore concrete ways towards a better future. We all dream of a safer world. Let's make it happen, together!'



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¹ For more information and to have a say about the future of pandemic preparedness, see: WHO Information Network for Epidemics (EPI-WIN) Imagining the future: conversations on the COVID-19 pandemic and other infectious threats. Geneva: World Health Organization; 2021 (<https://www.who.int/news-room/events/detail/2021/07/15/default-calendar/imagining-the-future-conversations-on-the-covid-19-pandemic-and-other-infectious-threats>).

Foresight for health system transformation

Supporting national health system transformation through health futures strategic dialogues

How can a vision for the whole health system in Mongolia in 2050 be developed? How can a national long-term transformative health agenda drive universal health care in the Philippines by 2030? How is healthy ageing integrated into Malaysia's future national health plans? How can mid- and short-term planning ensure implementation of a long-term strategic plan in any country in the Western Pacific Region?

In 2020, the Strategic Dialogue team in the Data, Strategy and Innovation group at the Western Pacific Regional Office initiated a series of strategic dialogues on health futures in collaboration with country offices and Member States in the Region to support countries in transforming their health systems as part of the Regional Office's strategy, For the Future. The dialogues are based on foresight processes that generate several future scenarios and drive national long-term transformation agendas by "backcasting", to shape future health systems, population health and well-being. The rationale for this approach is that, if the longer-term vision is clear, shorter-term planning is more effective in preparing health systems for the future. Over the past year, the country-tailored processes supported, facilitated and

enabled health futures strategic dialogues in Malaysia, Mongolia and the Philippines in horizon scanning and scenario development sessions, thematic deep dives and workshops in backcasting and change agenda.

The outputs of each stage have been different in each country. Still, the team considered stakeholders' experience, engagement and buy-in and identified elements that ensure a process that will yield transformative, inclusive change:

- ensuring a tailored, contextualized, innovative approach that is locally owned; and
- engaging and retaining all relevant stakeholders at both strategic or leadership level and at the working level in ministries and country offices.

Enhancing the value of futures-oriented policy and planning

Providing the means for Member States, partners and stakeholders to exchange insights and perspectives about the future of health in the Region was an important consideration for hosting the first Health Futures Forum, in 2021. The 3-day virtual conference encouraged Member States to imagine alternative health futures and better understand the dimensions of change that drive and shape them. It highlighted the importance of thinking about health futures not just as an opportunity but as an obligation.

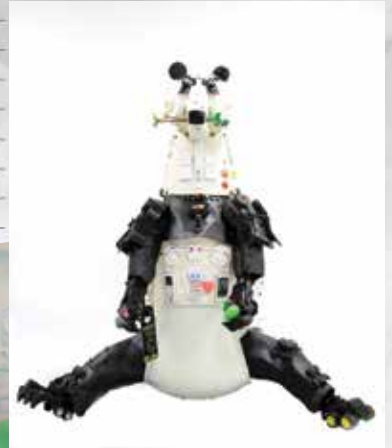
Catalysing futures dialogues by incorporating different perspectives

When the COVID-19 pandemic hit, the Strategic Dialogue team convened six futures think tanks, which drew upon multidisciplinary experts to capture the possibilities of future scenarios in which COVID-19 is part of our reality and impacts health systems, outcomes and status. The outcomes indicated strategic actions for the work of the Strategic Dialogue team and the different perspectives to be included in the futures dialogues.

Using the tried-and-tested foresight methods, the Strategic Dialogue team conducted three special projects to ensure that the futures represented diverse perspectives, including those of people not often heard from, thereby creating a comprehensive description of the future of health in the Western Pacific Region.

The SenseMaker Project brought in the voices and visions of young people of the shape of the future in 2032. Crowdsourcing for social health innovations also leveraged the imaginations of young people in Malaysia and the Philippines to identify the challenges that will affect health in 2050 and to find innovative solutions to address them. The current WHO Futures Art Exhibition depicts the future of health beyond words in a unique repository of visual futures representations, enabling deeper, better understanding of communities' points of view.





The Special Projects also yielded important insights to further inform WHO's futures work:

- **Imagining multiple futures to make robust decisions:** By thinking through different futures and examining our assumptions about preferred, probable and possible futures, we can practise resilience and collect and retain as many options as possible.
- **Integrating diverse perspectives and providing a sense of agency and empowerment to those involved:** The picture of the future will be richer, more nuanced and more comprehensive by incorporating diversity and varied perspectives. Looking through different lenses also helps us to minimize our blind spots and cognitive biases, at both individual and Organizational levels.
- **Embracing different ways of thinking for different insights:** By alternating between divergent and convergent thinking, we can continually shift between original, unthought of or out-of-the-box ideas to structured and analytical insights.

All the Special Projects engaged, stimulated and inspired communities in discussions about health and led to better understanding of their points of view, which will help shape government policy and WHO's work in the years to come.



Innovation

Foresight for health innovation: the WHO Innovation Scaling Framework

The WHO Innovation Hub developed the WHO Innovation Scaling Framework, informed by the past, validated by the present and aimed at the future. The Framework matches country health needs with existing innovations.⁴

The first use of the framework was a collaboration between the WHO Innovation Hub team and the WHO team in Somalia. This future-gazing use case helped to deliver an innovation that met the need for medical oxygen at Hanano Hospital in Dhusamareb, Galmudug State, and prepared the Hospital to respond to future needs associated with the COVID-19 pandemic and beyond.



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The WHO Innovation Scaling Framework is being refined with a selected number of cases, such as the Somalia oxygen case, responding to needs in primary health care, noncommunicable diseases or mental health. With this refinement, the Framework will allow more pre-emptive matching of health demands and the direction and identification of existing innovations. The innovations could be social or community, digital products or a combination.

The primary health care focus of the Framework is an example of a means of reaching into the future of the COVID-19 pandemic. Indications of how we are lagging behind in universal health coverage indicate that we must build back stronger, more resilient health systems. The WHO Innovation Hub team has been working with WHO primary health care technical experts and innovation funders and aggregators, including the Million Lives Collective and the International Development Innovation Alliance, to identify relevant innovations that could be scaled up to meet the anticipated demand. Evidence to date indicates that particularly promising areas of innovation are digitally-enabled community health-care workers, patient education applications in reproductive, maternal and child health and telehealth support solutions for decentralized community interventions.

In these early foresight activities, the Innovation Scaling Framework has provided valuable reminders and lessons for working towards a future of health innovation impact.

- **Think beyond novelty:** Future health innovations need not be entirely novel or technology based. Innovation comprises any process or intervention that is new to a particular context. Before jumping into a new effort, ensure that you have thoroughly reviewed what is already available and considered different geographical and therapeutic contexts.
- **Always anchor in the “why”:** It’s easy to get carried away in a future vision of innovation. Never allow this to distract from the “why”.
- **Don’t be fooled by weak signals:** Innovation foresight includes balancing ambitious futures thinking with pragmatic, data-driven action plans. Be bold in your health innovation ambitions. Do not be deterred by the unknowns (there will be many), and anchor them in evidence of what is already known.
- **Accept a variable pace:** Innovation is not a sprint. It is an ultramarathon.

⁴ If you are interested in learning more about how the WHO Innovation Hub is building towards a future of demand-driven health innovation, please contact the team directly on innovation@who.int and join the WHO Innovation Network.

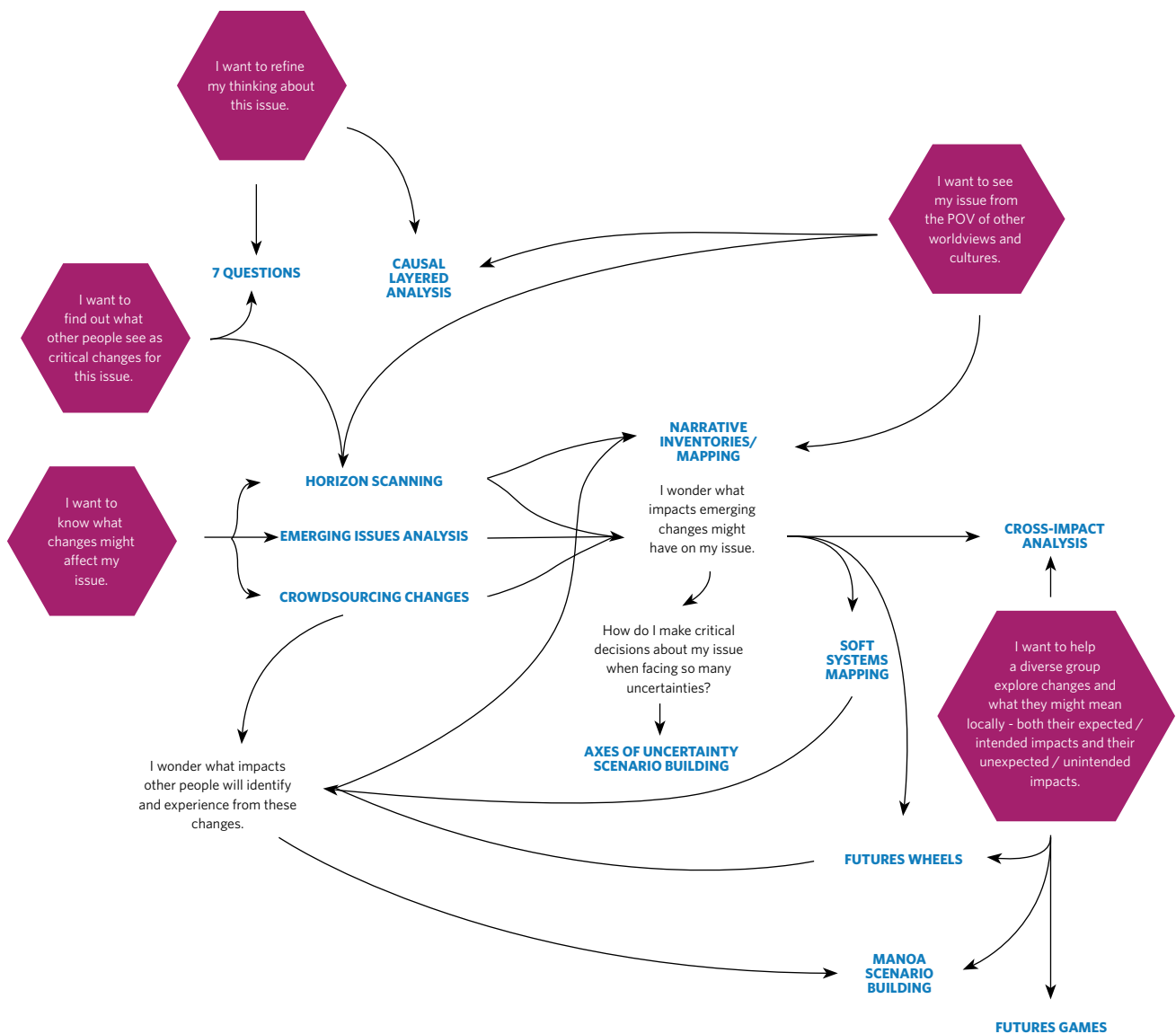
Annex

Inventory of methods

This overview draws upon more than 50 years of futures studies and foresight, as well as applied practice and case studies. See the Glossary for explanations of unfamiliar terms. See the decision tree below for initial pointers for deciding which of the tools described below might best suit your questions and needs.

Questions and methods flow chart/decision tree

See following pages for descriptions of these methods.



Framing the issue and the context of change

What's your focus? Why should you look up and look ahead?

What's the issue?

This focus question is the start of most scenario planning but is useful in its own right. What issue, question or problem keeps you awake at night? What solutions do you need most that are future-proof?

Seven questions

In a structured interview, ask:

- If you were a clairvoyant and could see into the future, what would it be most useful to know?
- What is your most optimistic outcome?
- Your most pessimistic?
- What would you have to change internally to achieve the optimistic outcome?
- Looking back 20 years, what has shaped today?
- Looking forward, what near-term decisions are required?
- What would you do if freed from all constraints?

This elicits a very rich picture of the interviewees' views of change for the foresight topic.

Causal layered analysis

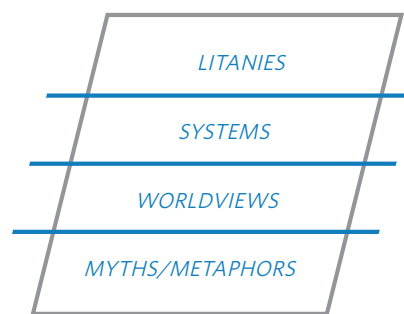
Foresight may be superficial if it is too focused on surface trends and events. Digging beneath observable events uncovers the systems and structures that drive events and changes; analysing world views, paradigms and cultural structures uncovers the internalized assumptions that create the systems and structures. Causal layered analysis systematically takes participants down through successive analytical layers to expose leverage points for change.

This technique provides a deep dive into a single issue, change or future. Participants choose an issue and drill down through four layers of understanding with the following basic questions on any issue:

- What are people talking about? Experiencing? What events are related to the issue? Trending tweets or headlines?

- Why are these events happening? What explanations can we give? What do the data suggest?
- What world views or values drive the issue? What values prevent the issue from changing?
- If you were to sum this issue up in a metaphor or image, what would it be? E.g., "this issue is like a flash flood, because...." or "our association is like a wine cellar, because...." What metaphors and images are people using to describe the issue?

Working down through these layered questions can help break through cultural and professional blind spots in addressing issues. It can also be used to generate scenarios or visions, by choosing an alternative metaphor or world view and building back up into systems and events.



CAUSAL LAYERED ANALYSIS

Narrative mapping

People make sense of their world – its history, its context and possible changes – by telling stories. A core assumption of foresight is that people's ideas about both possible and preferable futures affect their actions today. A useful approach to understanding different perceptions of change is to collect people's ideas about change and the future in the form of stories or narratives. Ethnographic research and in-depth interviews are face-to-face methods of story collection. Digital communication platforms and social media enable mass capture of narrative and analysis via text mining of social media content related to change and the future. Dedicated software platforms offer the capacity to create crowdsourcing campaigns to ask people to share stories about changes that are affecting them or their communities or mini-narratives about alternative or preferred futures.

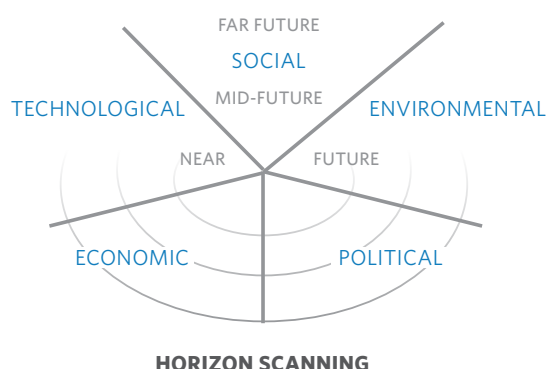
Heightening awareness of change

What's changing around you? What signals of emerging change are just beginning to arise?

Horizon scanning

The bedrock of futures research and foresight is data about change. Foresight begins with heightened awareness of change. As change occurs everywhere, we must scan everywhere to spot it. As with radar and sonar, scanning requires a 360° sweep of the horizon to spot change.

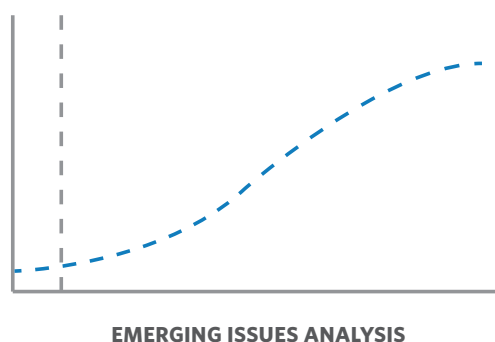
Horizon scanning is a primary futures method for identifying and monitoring emerging change. High-quality scanning identifies both significant trends of change and also emerging signals of change that are objectively new, even to experts. Horizon scanning is a structured, expanding, continuous search for drivers, trends and emerging signals of change in all sectors – social, political, economic, environmental and discovery (science and technology). The goal is to identify changes over time for analysis, social dialogue, impact assessment and policy.



Emerging issues analysis

Identification of significant change starts with trends but must also include early warning of potential change by spotting weak signals of change – the first hints that a transformational change might be emerging.

Emerging issues analysis is a core component of horizon scanning. It is used to identify initial sources of change, that is, the very first instance of a change, e.g., When was a cell-phone first used to transfer money? This is usually done by monitoring outliers, such as people who are early adopters, brilliant innovators or paradigm-busters or rebels. As the analysis focuses on spotting first cases, reports are generally qualitative, describing initial instances of change as case studies, not as statistically significant trends. Emerging issues analysis is a focused search for emerging, often weak signals of evolving change and tracking of those signals over time to determine whether, and how fast, they mature into trends.



Crowdsourcing changes

The digital age is changing the practice of foresight. Global digital connectivity through smartphones also enables data-gathering campaigns through social media networks to engage hundreds of people in foresight activities. Crowdsourcing platforms now enable researchers to build simple interfaces for asking people to report the changes they are seeing locally, identify potential impacts and even suggest responses; the platform then builds a composite system map in the background. In other foresight crowdsourcing campaigns, people have been asked to share stories of the future, sketches of possible futures or ideas about ideal futures for their communities. The value is for potential comparative analysis of diverse perspectives, cultures and contexts.

Evaluating implications and impacts

How will change evolve and affect systems of interest?

Stakeholder identification

Change generates a broad range of effects; however, the impacts are felt disproportionately in a community, organization or country. Thus, mapping the implications of a change should begin with determining which stakeholders will be affected by the change and how, who is usually unseen and unheard and not seated and who should be seen, heard and at the table.

Soft systems mapping and impacts mapping

Variables of strategic and substantive interest and connections among influences are identified to spot feedback loops that might create “ecologies of change” that will accelerate or constrain change. Soft systems mapping engages participants in identifying concepts and variables in the operating environment of an issue (e.g., education and learning or information infrastructure), mapping them as nodes in a system and suggesting how the nodes interconnect to form either positive feedback loops (“virtuous circles” or “vicious circles”, accelerators of change) or negative feedback loops (balancing loops that may constrain change, whether hindering goal achievement or slowing unwanted impacts).

Cross-impact analysis

Simple cross-impact analyses can help people consider how multiple changes might interact. Cross-impact analysis begins with identification of a limited number (e.g., five to seven) of relevant variables. Each variable is considered in relation to all of the others: What will be the results of their interaction? Will they amplify each other? Negate each other? What additional changes might their collision or interaction create? A cross-impact table enables a structured, systematic assessment of how a given set of variables will interact over time.

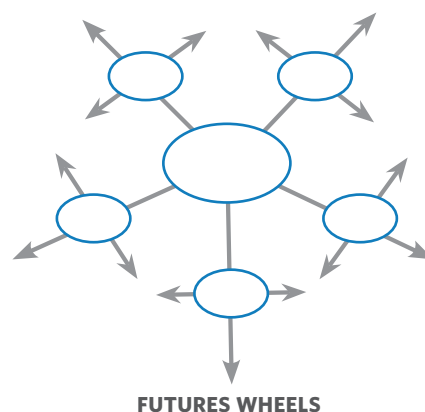
Futures wheels

You’ve spotted provocative emerging changes. Now what? Answering this question is a critical step after identifying trends and emerging issues. Futures wheels are an engaging participatory process for mapping the cascades of impacts that might be generated by a single change.

A futures wheel is a graphic visualization of direct and indirect future consequences of a particular change or

development. It is a structured tool for brainstorming on the future of a specific change and on the consequences and interactions of impacts. Futures wheels are also called “impact wheels”, “consequence wheels” and “implementation wheels” and are similar to mind mapping and webbing.

A useful feature of futures wheels is their use for creating counterintuitive outcomes: mapping of impact cascades through primary, secondary and tertiary outcomes often generates surprising possibilities. To create futures wheels, participants explore and map successive cascades of impacts created by a single significant change; this helps them to extrapolate potential surprises, disruptions and backlashes as well as emerging opportunities. Futures wheels assist groups in creating extensive maps of impacts, implications and both intended and unintended consequences of change.



Futures games

Futures games are opportunities for groups of people to explore changes and their impacts on daily life, the built environment or social structures by role-playing emerging futures. They may consist of using decks of cards to summarize trends, patterns of change and goals for prototype artefacts of the future or mapping how change might transform their communities. Futures games like The Thing from the Future, which prompts participants to design potential future artefacts, are usually played face to face. Digital platforms such as UrgentEVOKE and MMOWGLI Black Swan and social media have enabled creation of multi-player online role-playing games for exploring change and possible futures.

Exploring alternative futures

What range of outcomes might result?

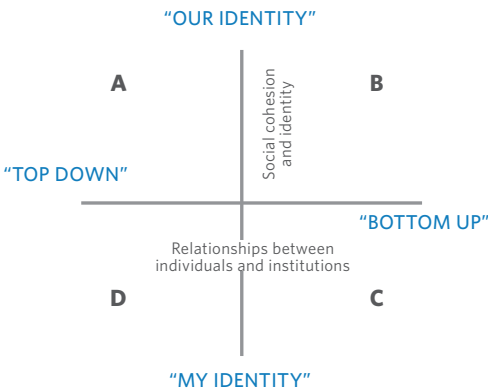
Existing scenarios

We are surrounded by images of the future; they are embedded throughout our cultures, in our myths and religious stories, in political ideologies, in advertising, in cinema and television. Companies and government agencies generate scenarios as part of strategic decision-making. Compiling and analysing the major themes of scenarios generated to explore the future of similar issues can be useful and more cost-effective than generating a new set. The compilation and analysis approach often finds enough common stories to identify “scenario archetypes”.

Scenario planning – “axes of uncertainty”

Leaders want to improve their ability to manage uncertainty. Spotting change as it emerges is one thing; knowing what to do in response is another – especially as change itself is volatile. We’re never sure what twists and turns it might take as it evolves. This approach to scenario building addresses uncertainty directly.

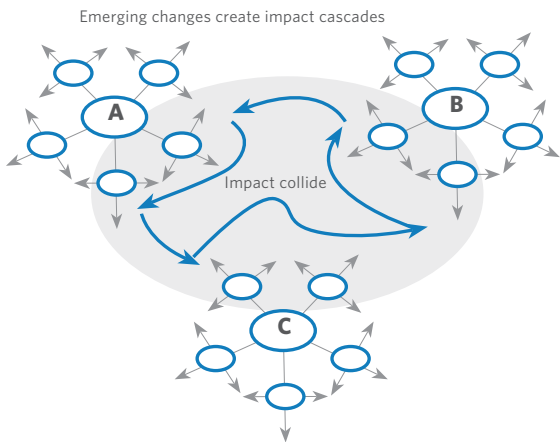
Framing scenario building with the initial question, “What keeps you awake at night?” is admirably suited to strategic foresight and use of scenarios for decision-making. This scenario-building technique provides a choice between two highly important but highly uncertain drivers of change and creates a 2 ´ 2 matrix by expressing each driver as a continuum between two opposite uncertain outcomes. Each cell of the matrix expresses a potential future bounded by combinations of uncertain outcomes, allowing exploration of how the goals and strategies could be adapted for resilience in the face of uncertainty.



Manoa scenario-building

Change is not binary – it is not an either/or proposition. The present we experience evolved from multiple overlapping changes and their collision and interconnecting impacts. The Manoa approach to scenario-building reflects that understanding of multiple overlapping changes. It maximizes difference from the present. Emerging issues have potential impacts and cross-impacts, which are woven into a narrative of a possibly surprising, transformative or disruptive future.

This approach to scenario-building does not require a focus or critical question to start. It begins with the identification of three emerging issues of change, explores their primary and long-range impacts and results in the possible outcomes of those impacts in collision. The scenario of a single alternative future emerges from combining all three changes and their impacts. To create four different scenarios, one starts with 12 different trends or emerging changes (three changes per scenario ´ four scenarios = 12 changes to stimulate ideas). With Manoa, you build up a library of alternative possible futures from your horizon scanning data and then use that array of futures to explore outcomes for decisions, initiatives, projects or policies.



Articulating preferred futures

What future is the best outcome for our values and goals?

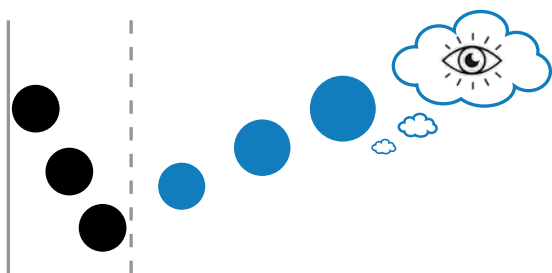
Existing visions inventory

Visions of preferred futures are embedded in our cultures, whether national, ethnic or organizational. Each individual has ideas about what a better future might look like. Collection of such narratives from stakeholders and communities provides insights into local needs and aspirations. A variety of approaches exists for collecting and analysing images of the future, which should be identified, as they may compete with the message of your futures project.

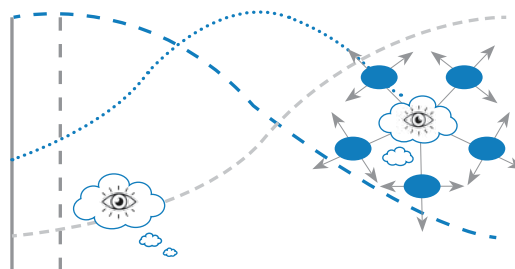
Reverse the negative

What are your deepest worries about the future? What are the worst challenges you fear we may face? Do your worries hinder your ability to voice your best hopes and aspirations for the future? Unacknowledged fears can create a stumbling block when helping people to envision more desirable futures; or, you can voice those fears and use them as a springboard to voice transformative hopes.

Many vision methods clear the air with a cathartic warm-up; that is, people share their deep worries and fears about the challenges to their issue. It is invaluable to acknowledge concerns explicitly before moving beyond them to express aspirations. This exercise ensures catharsis and then uses it to launch people into expressing audacious goals. It does so by the almost mechanical function of asking people to restate their fears as their logical opposites, being as specific as possible. For example, if a worst fear for future social justice is the number of children worldwide who suffer poverty and homelessness, the logical extreme and specific opposite would be: In the future, “all children everywhere have clothing, food and shelter”. The list of logical opposite positives can then be clustered, systemically interlinked, elaborated and extended by additional ideas that emerge to fill any aspirational gaps.



This is an excellent warm-up for any vision method and can also be extended to be an efficient stand-alone vision exercise in its own right.



Seeds visioning

Our newsfeeds are filled with crises and catastrophes. It may be difficult to find optimism for visioning. Instead of dwelling on what's wrong, we could search for examples of local projects and community and organizational initiatives that are creating positive, transformative change. These can then serve as building blocks to envision desirable futures.

This approach provides a complexity-based, creative, transformative set of positive visions for the future. The method is focused on success – a characteristic it shares with “appreciative enquiry” – in that visions evolve by combining “seeds” of novel and transformative pilot projects that are subsequently implemented and succeeding locally in the real world, exploring the cascades of impact they generate, combining the changes and impacts into a visionary narrative and then backcasting within the “three horizons framework” for mapping action. This gives idealistic visions a strong foundation in practical action and role models for the next steps to nurture change. The aim of this project was to create good stories about the future, and subsequent projects have used the method for the same end.

This method is designed to avoid generic futures and the futures embedded in the social context, popular media and most academic literature. Its aim is to transcend “used futures” and to develop positive transformative stories that are fresh and local. The use of Manoa scenario-building as the core detail generator arose from its focus on maximizing differences from current conditions.

This approach to visioning begins with local projects that are creating positive change as the core “seeds” of a vision. The impacts of the positive projects are extrapolated in futures wheels to depict a detailed picture of a desirable future, and the steps to that future are explored in the three horizons framework.

Appreciative enquiry (for visioning)

The best way to predict the future, it has been said, is to create it. Collaboration in articulating a vision of a preferred future is the first step. One approach to visioning is to begin with past successes and current strengths, such as with appreciative enquiry, in which questions are asked about the group and then a future is designed according to the strengths identified.

Appreciative enquiry was designed to respond to an overemphasis on “problem solving” in organizations. It focuses instead on affirmation, creating positive outcomes

from the past successes and proven strengths of a team, organization or community. Furthermore, it is based on the assumption that all human organizations are created, maintained and changed by conversations and stories. It maps an organization’s stories of strengths, aspirations and resources to design a preferred future and suggests the changes to be made to move towards that future. Appreciative enquiry is a change-management approach that identifies what is working well, analysing why it is working well and then doing more of it, or applying it to innovate and disrupt. It consists of building on past success to achieve transformative change.

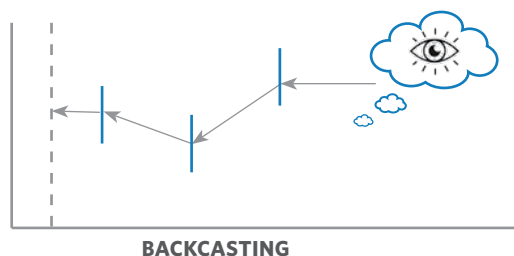
Creating change

How do we identify allies and resources to help create our preferred outcome in a context of evolving change?

Backcasting

Envisioning better futures isn’t difficult. Achieving them is difficult. Truly transformative, audacious visions may appear too idealistic to accomplish. Backcasting helps you to stand in your preferred future and create a bridge of practical steps from your vision to the present.

Participants identify one or more images of the future as a goal. They backcast by asking what logically had to occur to create that outcome. This includes discussing and exploring the necessary infrastructure (technological, economic, regulatory) and identifying milestones passed, opportunities taken and obstacles overcome. In narrative terms, it is “telling the story of how we got here”, creating the vision’s history. Participant diversity helps ensure that a complete, multi-dimensional history is backcast, for a wider range of possible implementation paths to the desired future. Backcasting requires logical mapping of necessary steps to create a specified outcome, working backwards from the future outcome to present conditions.



Wind-tunelling

You’ve identified some significant changes and mapped potential impacts. You have built scenarios to explore alternative outcomes, visioned to create transformative goals and have even come up with some strategies to reach those goals. How can you be sure those strategies will work well in whatever future they might face on the way to realizing your vision? Wind-tunnelling tests your proposed strategies against the future conditions suggested by a collection of scenarios and helps to make strategies more resilient.

Participants use a set of alternative future scenarios to evaluate proposed strategies or policies, rating them for potential effectiveness and robustness under different conditions, looking for those that are most robust. Wind-tunnelling can help to assess the overall resilience of plans and strategies and may also be used to generate additional innovative strategies to implement change.

Stakeholder and resource analysis

Mapping should be conducted of who is concerned and what is needed to implement a strategy or policy. In the case of stakeholders, the focus is to identify what would make the proposed strategy or policy a plus for them. There are multiple approaches and templates for stakeholder identification and analysis. A simple approach is to ask who is enthusiastic about the issue, a proponent; who is indifferent, a bystander; and who actively opposes the issue or change. Another approach is to identify the people, organizations or communities that are potentially affected by the issue and to map the source of their interest.

