International Science Council

COVID-19 Scenarios

The importance of systems thinking & global cooperation to improve long-term outcomes of global emergencies

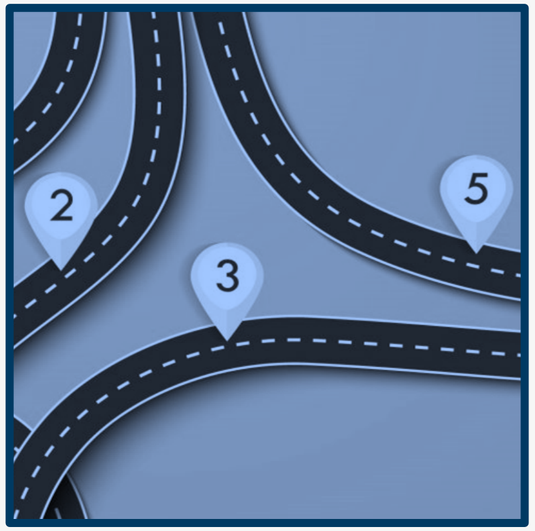
A major initiative by the ISC

Sir Peter Gluckman

13th October 2021

COVID-19 Scenarios

- In Nov 2020, the ISC convened a group to consider its role in the pandemic chaired by Sir David Skegg (NZ)
- Dr Salim Abdool Karim (SA) proposed a focus on longer-term scenarios
- In March 2021, the ISC, WHO, UNDRR launched an exercise to outline potential three-seven year global COVID-19 scenarios.
- The rationale for this exercise was:
  - There were over-optimistic views of the impact of vaccine introduction.
  - Short-term and narrow thinking by governments.
  - Obvious evidence of gross inequalities in likely outcomes.
- **The goal is to help the global community understand the options for achieving an optimistic & fair end to the pandemic.**



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Oversight Panel

Peter Gluckman (NZ) chair *Science advice/ diplomacy*	Salim Abdool Karim (SA) *ID Epi/Public health*	Peter Piot (UK, Belgium) *Microbiology/ Public health*	Christiane Woopen (Germany) *Medical ethicist*
Geoffrey Boulton (UK) *Geoscience*	Craig Calhoun (USA) *Sociology*	David Spiegelhalter (UK) Statistics	Claudio Struchiner (Brazil) Mathematical *modelling/ ID pop.*
David Skegg (NZ) Epi/public health	Aminata Sall Diallo (Senegal) *Physiology*	Lucia Reisch (Denmark) *Economics*	Soumya Swaminathan *(WHO)**
Chor Pharn Lee *Government strategy*	George Gao (China) *Virology/ immunology/ Public health*	Ismail Serageldin (Egypt) *Int. development /economics*	Mami Mitzutori *(UNDRR)**
Ian Goldin *Economics*	Eric Goosby (USA) *Public health*	Elizabeth Jelin (Argentina)) *Sociology*	Anjana Singh (Nepal) *Microbiology/ Public health*

Regional groups/Expert Insights

ISC

*Observers

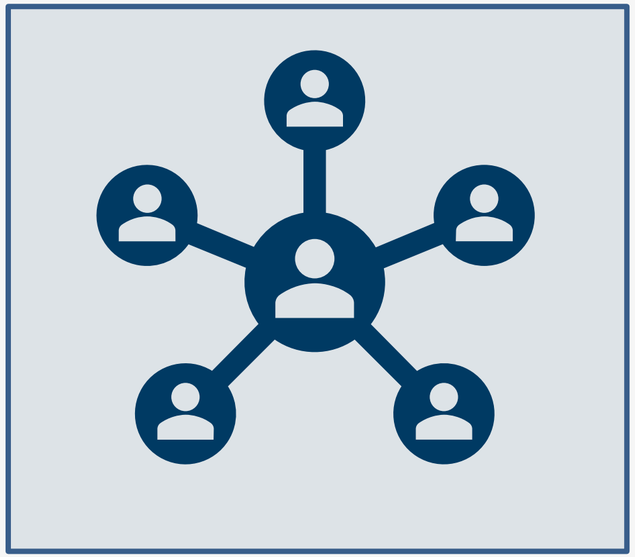
Target Audience

Decision makers:

- Governments
- Global agencies (WHO, UNDRR, World Bank, IMF, GAVI)

Influential actors:

- Civil Society Groups
- ISC Members
- Global actors (OECD, WEF, BMGF)
- Other scientific groups



Project Goals

1. To assist & inform policy & public understanding of plausible mid- and long-term Covid-19 outcome scenarios
2. To understand the impact of these scenarios.
3. To identify policies or system changes will lead to best outcomes and minimize negative outcomes

What events and decisions will likely emerge in the next few years

How these events or decisions made by individual actors today will have broader consequences for the evolution of the pandemic and its global impact in the next few years

What strategies and policies will lead to the best attainable outcomes

Approach

- A systematic approach used to outline the possible 3- 7 year scenarios.
- **167 global experts** were engaged to map out the most critical **vectors of uncertainty** that might sway the outcome of the pandemic positively or negatively.
    - e.g. these might be policy decisions like contribution to global vaccine stocks or exogenous events, like the evolution of SARS-CoV-2 or the occurrence of other natural disasters
- **63 experts** painted a picture of plausible most likely, best- and worst-case scenarios.
- Regional workshops were also held to ensure that issues pertinent to all regions were covered
- The oversight panel and government advisors/officials working on national long-term COVID-19 planning provided input on the project methodology, tested key messages, and shared local and regional lessons.

Approach

March – November 2021

Phase 1: Vectors of Uncertainty (Systems Map)

Goals:

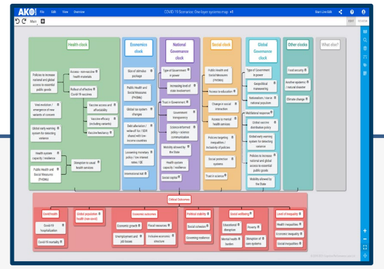
- Identify the most critical events, factors and stakeholders that/who will have an impact on Covid-19 outcomes in next 3-5 yrs
- Understand uncertainties/certainties per factor/stakeholder
- Understand which factors are most critical globally and per region

Method:

- Secondary literature
- Interviews /survey (93 experts)
- Systems Mapping
- Regional workshops (73 experts)

Output:

- Visual map showing critical events and decisions that will impact global Covid-19 Outcomes



Phase 2: Outcome Scenarios

Goals:

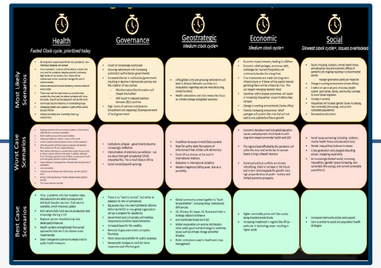
- Understand most plausible, best and worst case scenarios for priority vectors of uncertainty
- Outline range of outcome scenarios on a regional and global level

Method:

- Secondary literature
- Interviews /survey (93 experts)

Output:

- Plausible 5 year Covid-19 outcome scenarios



Phase 3: Policy Recommendations

Goals:

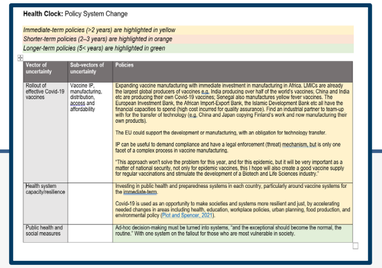
- Identify potential global/regional/ national strategy/policies to encourage positive global health outcomes, inequalities and the economy.

Method:

- Secondary literature
- Interviews (63 experts)

Output:

- High level polices or systems changes to help achieve best possible outcome



The Systems Map?

- Visual mapping of key decisions and events that will impact the long-term outcomes of the pandemic; its evolution and broader consequences
- It is a heuristic tool that demonstrates the factors that will influence outcomes and where the most critical uncertainties lie
- This tool will allow policy makers and stakeholders to assess the impacts of the decisions that they take
- It does not include all factors that might impact the outcomes; only priority factors

Clocks & Vectors of Uncertainty

- The various dimensions of the crisis are explored using the concept of “clocks”. Seven clocks represent the critical dimensions that are impacted by the pandemic, but at different speeds and on different timeframes.
- These are **health, social, economy, national governance, global governance** (the multilateral system and geopolitics), **environment and science and technology**.
- Each clock houses key **vectors of uncertainties.** These are uncertainties regarding events or policies that might affect the outcome of the pandemic positively or negatively.
    - 95 vectors were mapped out in the systems map based on expert input.
    - At a series of regional workshops these were ranked based on potential impact on the outcome of the pandemic and likelihood of occurrence. 41 critical vectors are highlighted

Clocks & Most Critical Vectors of Uncertainty

Health Clock	Economics Clock	National Governance Clock (Citizen-State Relations)	Geopolitics (& Multilateralism) Clock	Social Clock	Environment Clock	Science & Technology
Rollout of effective vaccines	Size of stimulus package	Government capacity & resources	State of multilateral institutions	Education	Food and water security/ WATSAN	Open science and knowledge sharing
Access to other essential health goods	Level of inflation	Type of Government in power (ideology)	Geopolitical opportunism	Policies targeting inequalities	Loss of focus SDS & climate change mitigation	Data collection, quality and openness
Emergence of variants of concern	Rising interest rates	Level of State involvement (positive and negative)	Multi-/bilateral cooperation	Mental health	Environmental degradation leading to more infectious diseases	Science education
Biosecurity Preparedness	LMIC access to global capital markets	National/subnational biosecurity/ disaster preparedness	Global vaccine distribution	Social and care system reform	Cascading risk of other epidemics/ natural disasters	Levels of misinformation/ disinformation
Health system capacity/resilience	Extend of global trade disruption	Social capital/ trust in Government	Global biosecurity/ disaster preparedness	Education recovery mechanism	One Health/ animal health strategy	R&D approach to managing epidemics
PHSMs	Private investment (including green investment)	Science informed policy + communication	Effective regional mechanisms			

Primary Outcome Measures

State of covid health

State of global population health (non-covid)

Level of social wellbeing

Rate of economic growth and degree of economic equality

Level of inequity

Societal stability & level of social cohesion

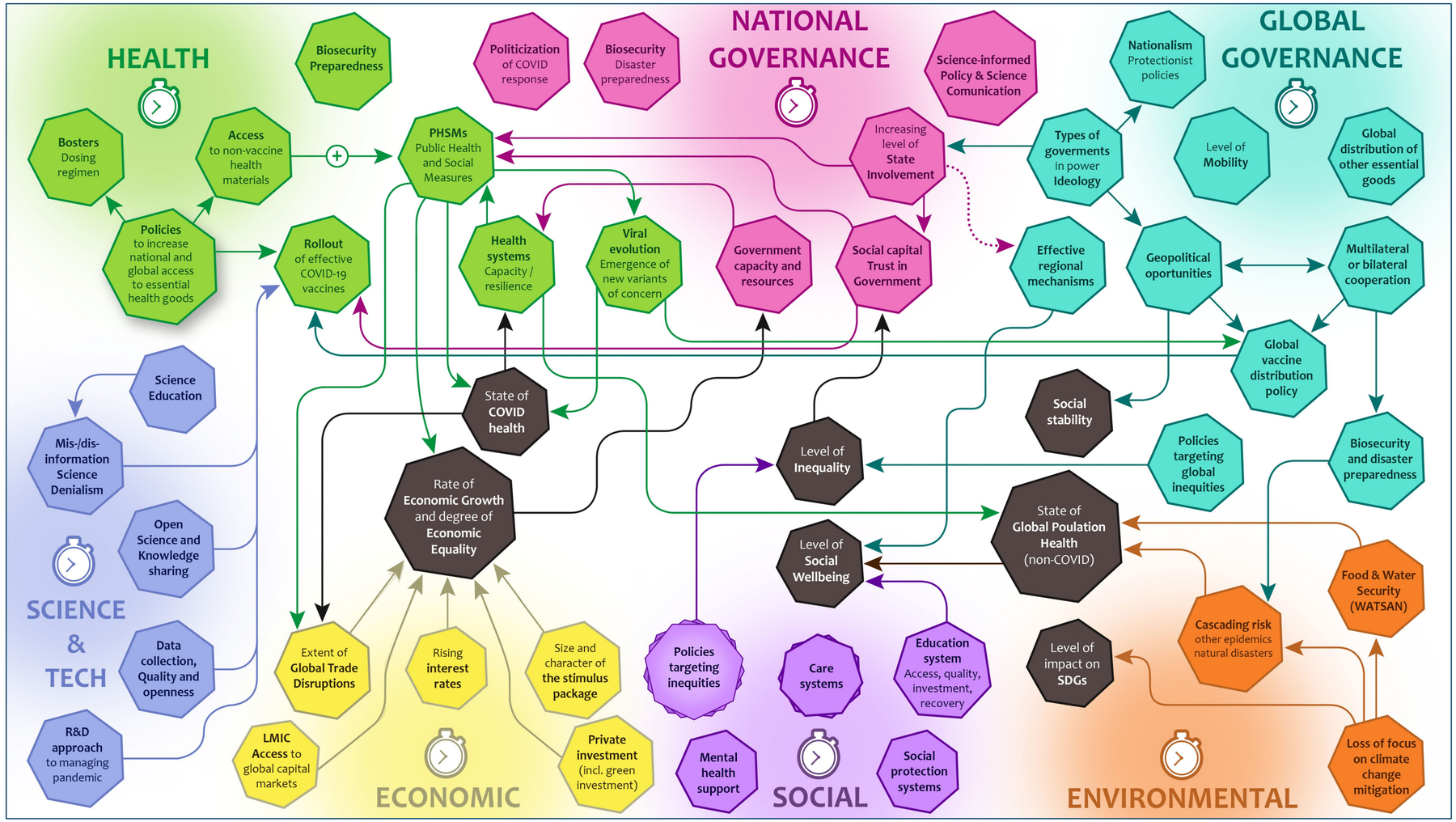
Global governance/geostrategic outcomes

Science & innovation systems

Impact on sustainability agenda

Impact on environment & future existential threats

All vectors are connected & impact critical outcomes



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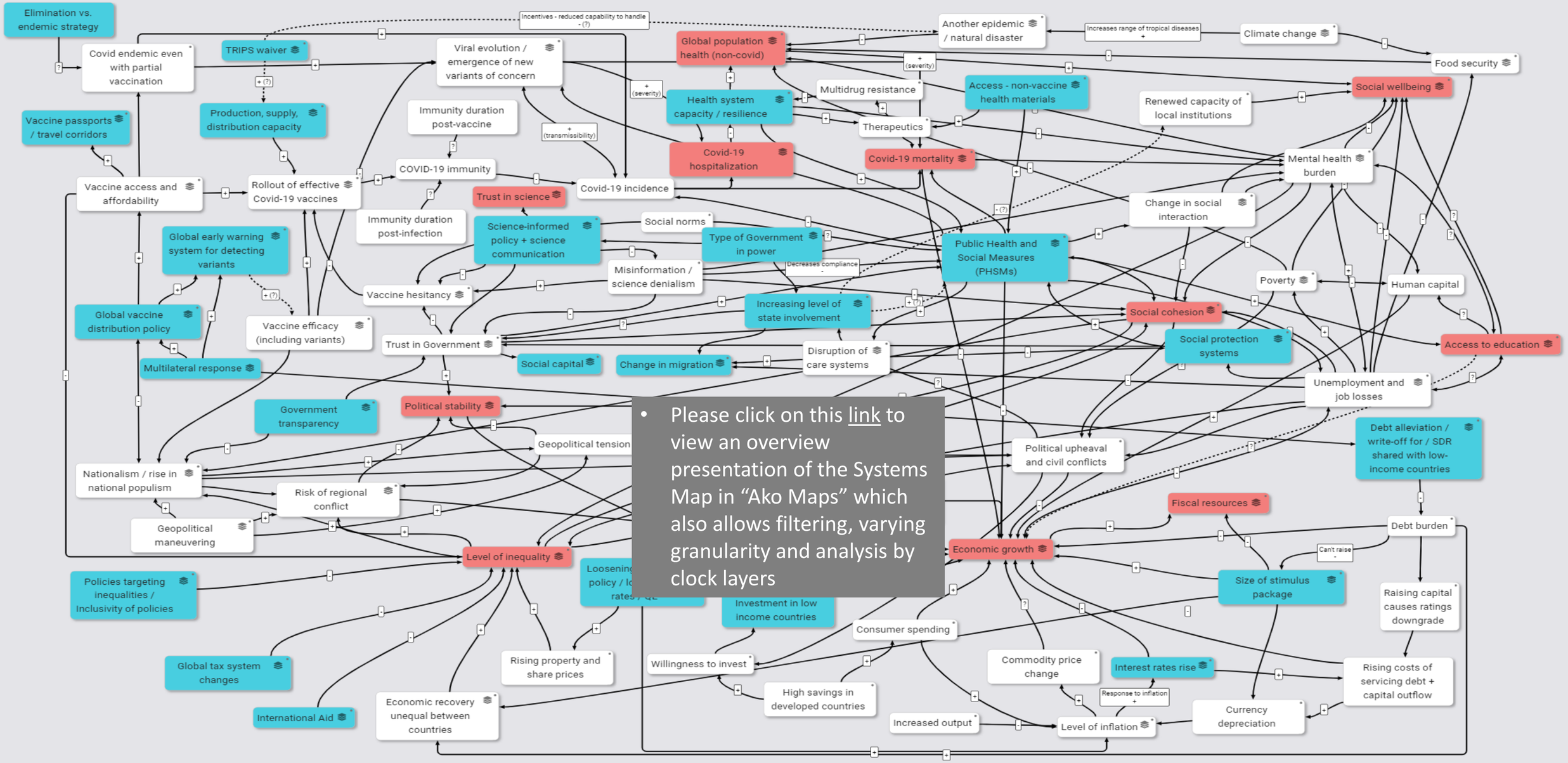
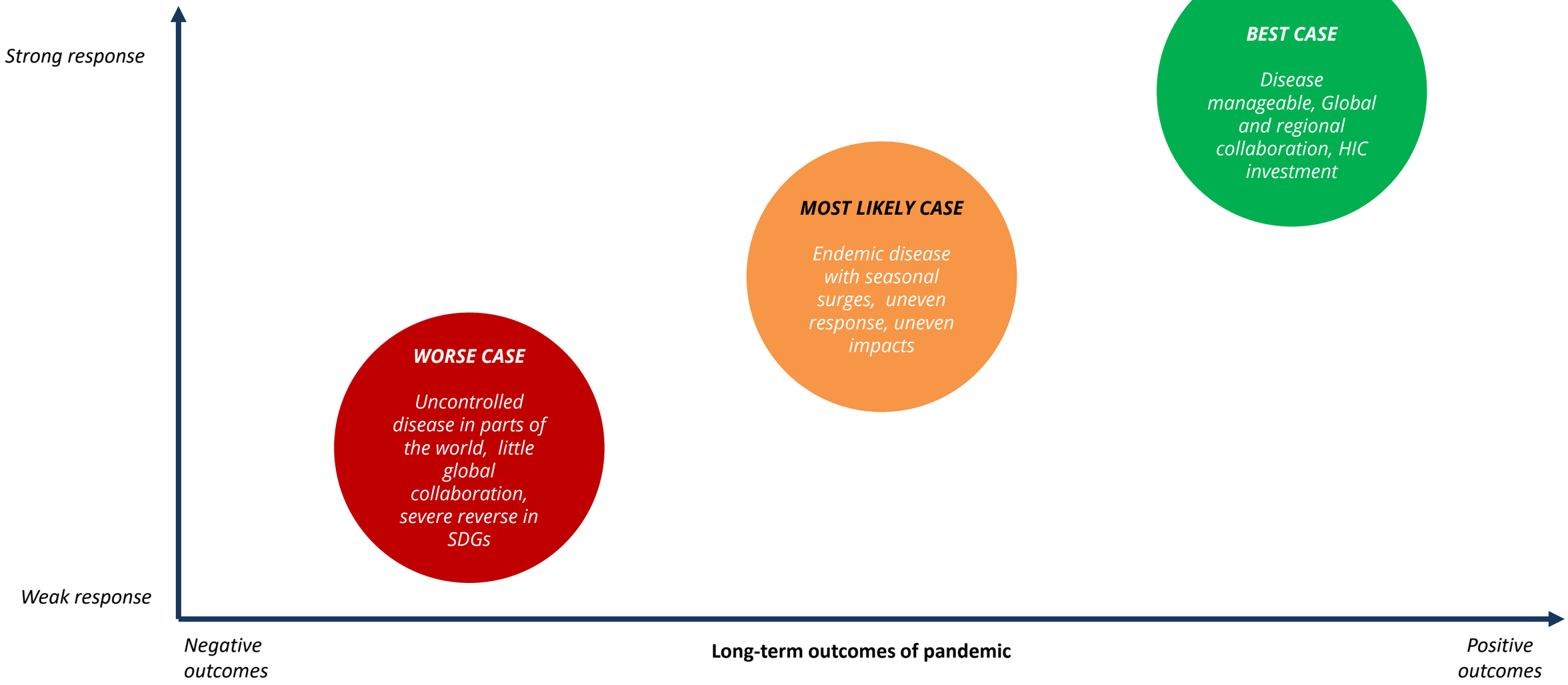


- Please click on this link to view an overview presentation of the Systems Map in “Ako Maps” which also allows filtering, varying granularity and analysis by clock layers

Three Scenarios explored



2026 Global Scenarios – high-level summary

Primary Outcome Domains	**Most Likely** *Endemic disease with seasonal surges, uneven response, uneven impacts*	**Worst Case** *Uncontrolled disease in parts of the world, little global collaboration, severe reverse in SDGs*	**Best Case** *Disease manageable, Global and regional collaboration, HIC investment*
State of covid health	• Disease is endemic with spikes in cases (seasonal). • ~ 60-70% adult global vaccine coverage in 5 years (initial dosing) • There is some vaccine escape as variants emerge • Booster mandates (heterologous) in HIC and some MIC for vulnerable populations and health care workers • Multiple therapeutic options available, but cost is a deterrent to access in many LMIC • LIC: High impact remains because of poor access to effective vaccines and emergence of variants of concern. • Vulnerable populations, essential and informal sector workers, and migrants are most impacted	• High impact across globe with seasonal surges overwhelming health systems in multiple countries. • Multiple variants have evaded natural and vaccine immunity; with worse outcomes than from Delta variant • ~ 60-70% adult global vaccine coverage (initial dosing), but booster (heterologous) required outside of vulnerable populations • Booster mandates have limited success and adherence to public health and social measures weakened • Vaccine/booster supply in LMIC limited because of booster supply to HIC. Regional manufacturing plants still being developed	• Low endemic transmission of virus. Prevalence is low and controlled in the majority of countries (LMIC and HIC). • > 80% adult global vaccine coverage. • Delta variant was the worst mutation of the virus; only minor mutations continue to occur. • Vaccines and naturally-acquired immune protection remain highly effective against new variants. Although, countries with access to vaccines have mandated the use of homologous boosters for key populations. • Cost-effective oral vaccines and therapeutics widely available through global financing mechanisms. • Other innovative technologies such as universal coronavirus vaccines are launched, but access is still limited.
State of global population health (non-covid)	• High levels & sustained harm as health & social care systems struggle to recover and investment is inadequate. Critical care still risks being overwhelmed during surges in LMIC, in particular.	• High levels & sustained harms as health & social care systems struggle to recover. • Critical care overwhelmed during surges in HIC and LMIC	• Low levels of non-COVID health harms in HIC due to targeted recovery policies that focus on boosting health systems, health worker recovery and that take advantage of innovative tools that became widespread during the pandemic (digital health)

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Level of social wellbeing	• Sustained levels of harms to social wellbeing due to ineffective and short-term remediation mechanisms and inadequate investment. • Mental health and education harms are the most prominent. • Groups most affected are the elderly, females (exposure, burden of care and GBV), and youth.	• High levels of harm to social well being due repeat use of stringent public and social health measures, inadequate prioritization of remediation mechanisms, unemployment and social unrest. LMIC most affected • Gender inequalities/violence increases • A lost generation who stopped attending school, impacting social skills.	• Similar to most likely case, although improved remediation policies and targeted investment that focus on vulnerable communities have been made; the impact of which will be seen in the longer term • Care is central to social and population health strategies
Rate of economic growth and degree of economic equality	• Growth sustained in developed markets (3-5 years only. Long-term growth uncertain) and China fuelled by large monetary and fiscal packages • Growth varied but limited in developing countries	• HIC: Stimulus packages combined with pent up consumer demand has fuelled inflation and rise in interest rates. • LMIC: Lower growth rates in the developed economies have had knock-on effects in developing countries	• Stimulus packages enhance productivity & growth in developed countries & China. • LMIC: Debt write-offs/ restructuring allows access to global capital markets and spurred growth. Green growth resulting in more private investment.
Level of inequity	• Major disparities within countries and across the globe • HIC and LMIC both affected despite some global and national efforts to target vulnerable populations.	• Disparities in countries and across the globe have worsened beyond 2021 levels due to repeat surges, worsened economic outlook and inadequate recovery policies and investment.	• Hopefully some reduction in disparities in countries and across the globe. In HIC and LMIC.

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Societal stability and level of social cohesion	• Polarization increased in countries with uncontrolled COVID & where misinformation is rife, weakening compliance to public health measures. Asian and Nordic countries with higher social capital fare better. • In many countries centralization of powers has weakened local/subnational governance e.g. in public health • Levels of corruption increased and civil engagement, and democratic governance eroded in many LMIC, especially unstable regions.	• Same as Scenario 1, except outcomes are worsened due to inability of government and health systems to cope with future surges.	• Local government and community leadership strengthened in many parts of the world, e.g. Africa CDC.
Global cooperation/ State of geopolitical relations'	• Geopolitical opportunism (measures to increase influence) related to vaccine distribution and export bans on critical raw materials has increased tensions between countries, especially between the US/Europe and China. • Some regional and global cooperation means better access to vaccines in LMIC. • Vaccine passports & travel bans worsen global inequalities. • Strained relations between US/EUR and China weaken global and regional trade relations and create geopolitical divisions, where some countries align with China and others with the US/EUR.	• Poor global and regional cooperation to address ongoing pandemic takes toll on COVID response worsening indirect health and social outcomes. • Strained relations between US/EUR and China weaken global and regional trade relations and create geopolitical divisions, where some countries align with China and others with the US/EUR. • Health nationalism has resulted in reduced focus on climate change and global solutions.	• The lack of global solidarity in pandemic management has resulted in increased local leadership and regional cooperation in LMIC. • Rise in public-private partnerships to fuel investment and growth.

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Impact on sustainability agenda	• SDG goals not reset. Progress setback by >10 years.	• SDG goals not reset & remain setback by >10 years.	• SDG goals are reset with new investment to recover progress lost during pandemic. Although, no outcomes are realized in five years, investment and policy commitments are made. Long-term benefits likely.
Impact on environment & future existential threats	• Enhanced biosecurity preparedness (at least for 10 yrs post pandemic) means that most countries are better equipped to deal with new ID outbreaks. • Green recovery measures are a fraction of COVID spending, Efforts to lessen impact on biodiversity and water sanitation is inadequate. • Food security remains a major concern in many countries as supply chain disruptions continue and economies struggle in many developing countries.	• Weakened health systems and stagnant growth in LMIC have weakened pandemic preparedness responses. • Attempts to accelerate economic recovery during/after the pandemic results in some relaxation of environmental and green recovery regulations impacting progress on SDGs. • COVID coupled with other natural emergencies, social unrest and conflicts further impacts supply chains, impacting food security.	• With leadership from the multilateral organizations, pandemic preparedness in many countries starts to prioritize investment in universal health coverage and considers an all of society systems approach. • Significant funds allocated to green recovery (similar to COVID-19 recovery spend) with a more even spread of fund among different sectors*

* Currently, more than 60% of green measures are sector specific and energy and surface transport are by far the most targeted both in terms of number of measures and funding (OECD)

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Impact on science & Innovation systems	• Open science and improved collaborative knowledge-sharing practices initiated during the pandemic remain among academics, NGOs, other sectors. • Issues with data sharing and disaggregation in LMICs continue. • Digital inequality continues to be an issue in LMICs. • Both LMICs and HICs continue to be susceptible to misinformation and disinformation as it becomes easier to spread. No change in regulation of social media companies.	• Open science and collaboration not maintained due to reduced investment by governments. • Misinformation continues to be spread among society, including by some government leaders impeding responses to surges in COVID-19 and other emergencies.	• Governments and society recognize that science is essential to defeating future existential threats, leading to improved science education and science integrated into policymaking communication. • Improved regulation has helped manage misinformation and disinformation spread through social media (government legislation, company policy and community education)

Lessons Learned

- Lessons for pandemic management
- Lessons for management of other existential crises
- Lessons for multilateral system
- Lessons for domestic policy systems
- Lessons for crisis management
- Lessons for evidence to policy
- Lessons for science diplomacy

Next Steps

- The project products will be a report and mapping tool for contextual use
- Update graphics for dynamic systems map
- The first report will be published in November 2021
- Next year conduct a policy development workshop to outline subnational, national, regional and global policy implications in more detail
- Revisit scenarios in two years
- Delve more closely into select clocks
- Potentially put tool into more interactive software

Next Steps for Policymakers

- Consider most relevant factors and uncertainties for specific countries and regions
- Conduct in-depth country level scenarios and analysis
- Conduct detailed policy development and stress testing for sub-national, national, regional and multilateral stakeholders
- Track short-term outcomes and update scenarios every two years

Conclusions

- The project provides a template for policy makers and experts to consider their forthcoming decisions in local context
- The work highlights the broad range of policy and societal implications of Covid over many years into the future
- The long-term implications extend well beyond the health domain
- It suggests actions made now will have long term consequences
- It highlights the complex interactions, and spillover effects that need to be considered
- It highlights what types of decisions should lead to better and more equitable outcomes
- To have better outcomes requires a stronger multilateral approach
- Vaccine access remains core to equitable outcomes
- At the national level, managing the pandemic forward requires pluralistic input into the policy actions
- The project demonstrates how ISC can bring multiple expertises to work with global agencies and multiple stakeholders on issues of immediate import