

Science 20

SAUDI ARABIA 2020

INFORMATION SESSION

April 23, 2020

INFORMATION SESSION – AGENDA



- **Opening Remarks**

- **S20 Overview**
- **S20 Taskforces**
- **S20 Advocacy**
- **Q&A Session**
- **Concluding Remarks**

Science 20

SAUDI ARABIA 2020



H.E. Dr. Fahad Almubarak

Sherpa, G20 2020

Minister of State, Member of Council of Ministers, Kingdom of Saudi Arabia

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Anas Alfaris, PhD

Chair, S20 2020

President, King Abdulaziz City for Science and Technology

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Tony Chan, PhD

Lead Organization, S20 2020

President, King Abdullah University of Science and Technology

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Amal Fatani, PhD

Sherpa, S20 2020

Professor, King Saud University



S 20

SAUDI ARABIA 2020
SCIENCE

S20 Overview



The S20 represents the scientific and research community and is comprised of the science academies of the G20 countries

-  Lincei National Academy (Italy)
-  German Academy of Sciences, Leopoldina
-  The Royal Society
-  National Academy of Sciences
-  Science Council of Japan
-  Turkish Academy of Sciences
-  Academy of Sciences South Africa
-  Russian Academy of Sciences
-  European Commission (EU)
-  Royal Society of Canada
-  Korean Academy of Science and Technology
-  Mexican Academy of Sciences
-  Indonesian Academy of Sciences
-  Indian National Science Academy
-  Chinese Academy of Sciences
-  Brazilian Academy of Sciences
-  Australian Academy of Sciences
-  National Academy of Exact, Physical and Natural Sciences
-  French Academy of Sciences

S20 Saudi Arabia engaged with previous S20 presidencies



Germany 2017

Improving Global Health
Strategies and Tools to
Combat Communicable and
Non-Communicable Disease



Japan 2019

Threats to coastal and Marine
Ecosystems, and conservation of
the ocean environment—with
special attention to marine
plastic waste

1

2

3

4



Argentina 2018

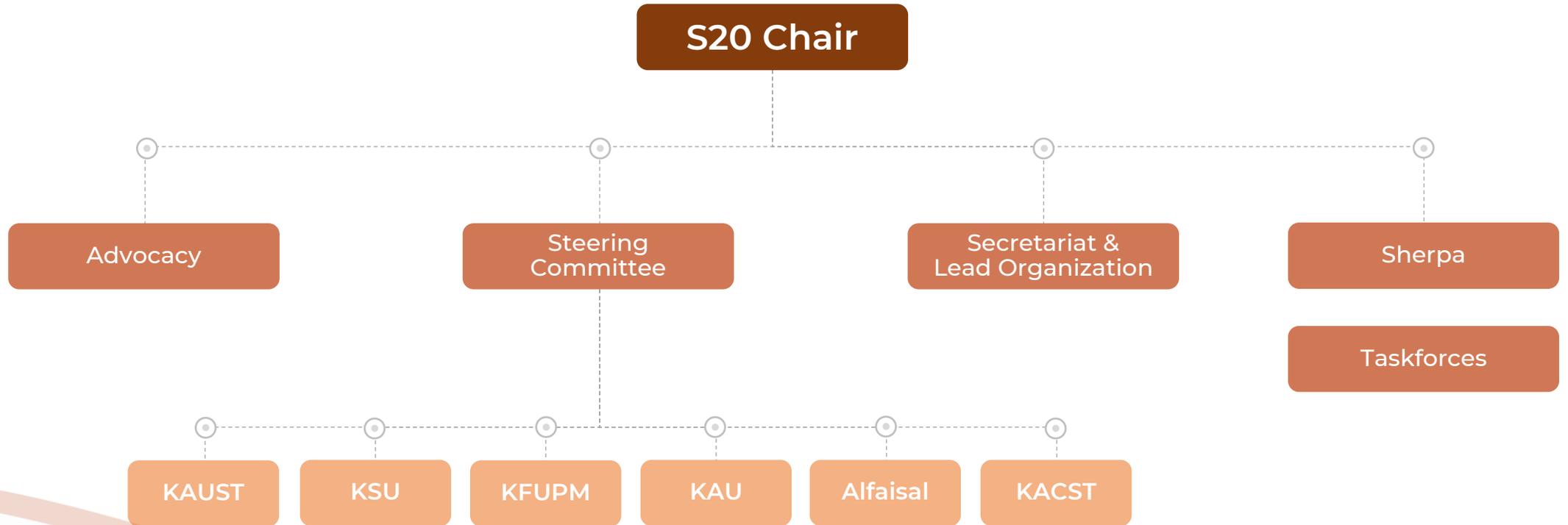
Food and nutrition security:
improving soils and
increasing productivity



S20 Saudi Arabia 2020

Foresight: Science for
Navigating Critical Transitions

S20 Saudi Arabia 2020 Governance Structure

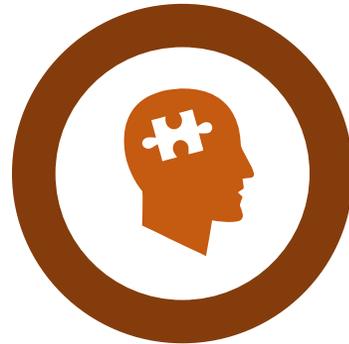


Key objectives and milestones to be achieved during the S20 Saudi Arabia's Presidency



S20 Priorities

Identified list of relevant topics on global agenda and for international and MENA science community



S20 Taskforces

Top experts engage in discussions and drafting of policy recommendations



Policy Papers

Action-oriented Policy recommendations, which are actually implementable



S20 Summit

A large-scale event at the end of the S20 cycle Recommendations



S20 Communiqué

S20 Communiqué contains specific policy recommendations



S20 Priorities are fully aligned with Saudi Arabia's G20 Agenda

1

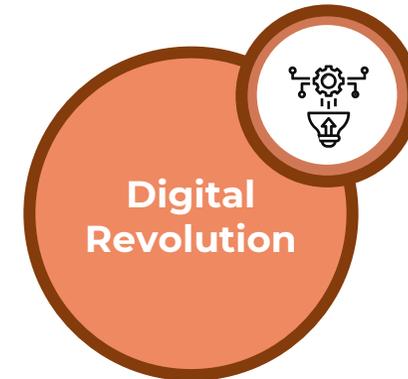
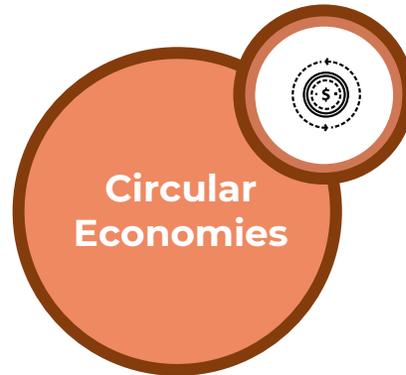
***Empowering People**, by creating the conditions in which all people – especially women and youth – can live, work and thrive.*

2

***Safeguarding the Planet**, by fostering collective efforts to protect our global commons.*

3

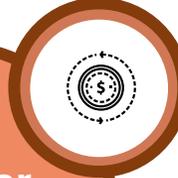
***Shaping New Frontiers**, by adopting long-term and bold strategies to share benefits of innovation and technological advancement.*



Relevance to the UN Sustainable Development Goals (SDGs)



Future of Health



Circular Economies



Digital Revolution

Central theme and approach for S20 Saudi Arabia Priority Areas

FORESIGHT: Science for Navigating Critical Transitions

The next several decades will witness a convergence of multiple transitions for our global society; these transitions must be navigated correctly, if disruptions in economic and political stability are to be avoided.

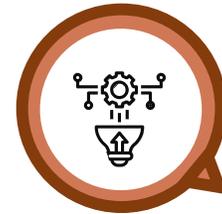
Each of these transitions are a challenge, yet there are also key synergies and interconnections between these transition that must be carefully appreciated.

Such key transitions compel G20 attention and foresight planning.



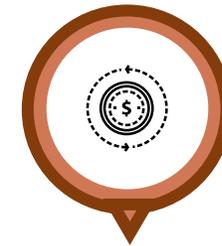
Digital Revolution

Achieving Universal Connectivity and Smarter Communities.



Circular Economy

Holistic Solutions for our Environment.



Future of Health

Preventing Pandemics and expanding personalized healthcare.



Connecting the Dots:
from Science to Action



S20 Taskforces – Workflow

Composition

Lead from S20 KSA.

Co-Lead from the G20 science academies.

Members selected with input from the Co-Lead and S20 Sherpa.

Transparent selection process strive for balanced representations

40 members per TF
8-10 members per subgroup

Interaction

Meetings and telecons to develop policy paper and recommendations

Surveys to identify key TF policy issues

Specific timeline to each taskforce bound by the S20 milestones and timelines.

S20 Secretariat will facilitate and provide needed logistical support to all taskforces

Output

Develop draft policy papers with recommendations.

Highlight the frameworks and actions for relevant global issues related to S20 theme

Based on the final version of all policy papers, the final S20 Communiqué will be produced.

S20 Taskforces Roles Overview: Lead, Co-Lead and Members

Position

Role Summary

Lead

Has responsibility, in conjunction with the S20 Sherpa, for agenda-setting, planning, implementation of taskforce activities, guides the drafting of policy papers, and presents taskforce recommendations; also moderates TF meetings.

Co-Lead

Co-Lead are important contributors to the development of policy recommendations and advocacy. They add value with ideas, guidance and proposals in the meetings and discussions of the taskforce. May coordinate certain activities especially when Lead is not present.

Task Force Members

Technical Coordinator

Supports and coordinates overall taskforce activities and takes the lead in operational activities, intermediary between Lead and members. and keeps members updated, monitors progress and provides guidance

Experts

Distinguished scientists with strong topical expertise that represent G20 Science Academies. Their principal task is to shape concrete policy papers by engaging in discussions, providing expert inputs, and sharing hands-on experiences.

Knowledge Partner

Supports the development of the initial draft of policy papers and key contents; supports Lead in moderation of meetings

S20 Task Force Applications

S20 Portal → S20 → Task Force Applications

Task Force Applications

S20 Saudi Arabia 2020

The name and photo associated with your Google account will be recorded when you upload files and submit this form.

* Required

Email address *

Your email

First Name *

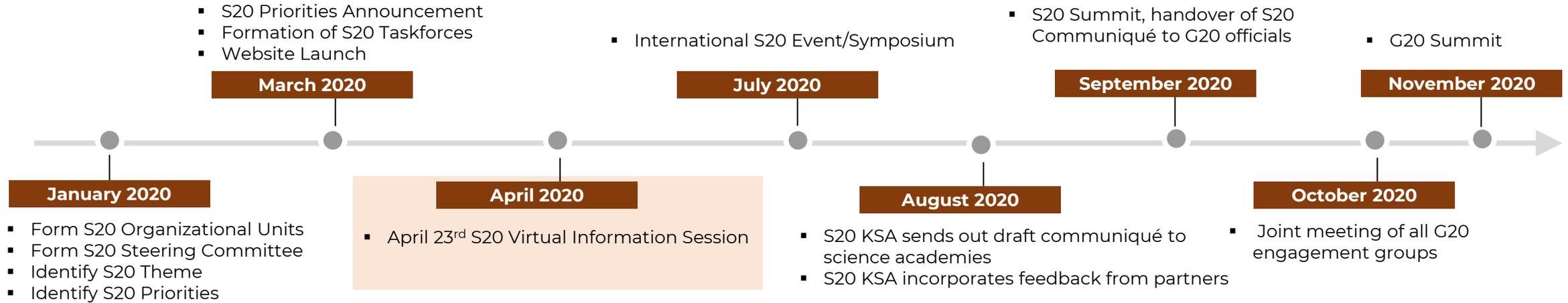
Your answer

Last Name *

Your answer

www.s20saudiArabia.org.sa

Way Forward S20 Outcome Roadmap to the S20 Summit



Quarterly Steering Committee meetings at key S20 milestones

Regular S20 representation at key international events

Close coordination with overall G20 calendar and events

TASKFORCE LEADS

Future of Health



Aws Alshamsan, PhD

Professor and Dean of College
of Pharmacy, King Saud
University

Circular Economy



Yousef Al-Yousef, PhD

Professor and VP of Research
Institutes, King Abdulaziz City
for Science and Technology

Digital Revolution



Tareq Al-Naffouri, PhD

Professor, Electrical
Engineering, King Abdullah
University of Science and
Technology

Connecting the Dots



Ali A. Al-Meshari, PhD

Lead, Upstream Research and
Development, Saudi Aramco



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SCIENCE

Taskforce 1

Future of Health:

Preventing Pandemics and Expanding
Personalized Healthcare

Future of Health – What it means

Issue

Collective understanding of the science that undergirds human health

Solution

Unraveling possible solutions based on cutting-edge science

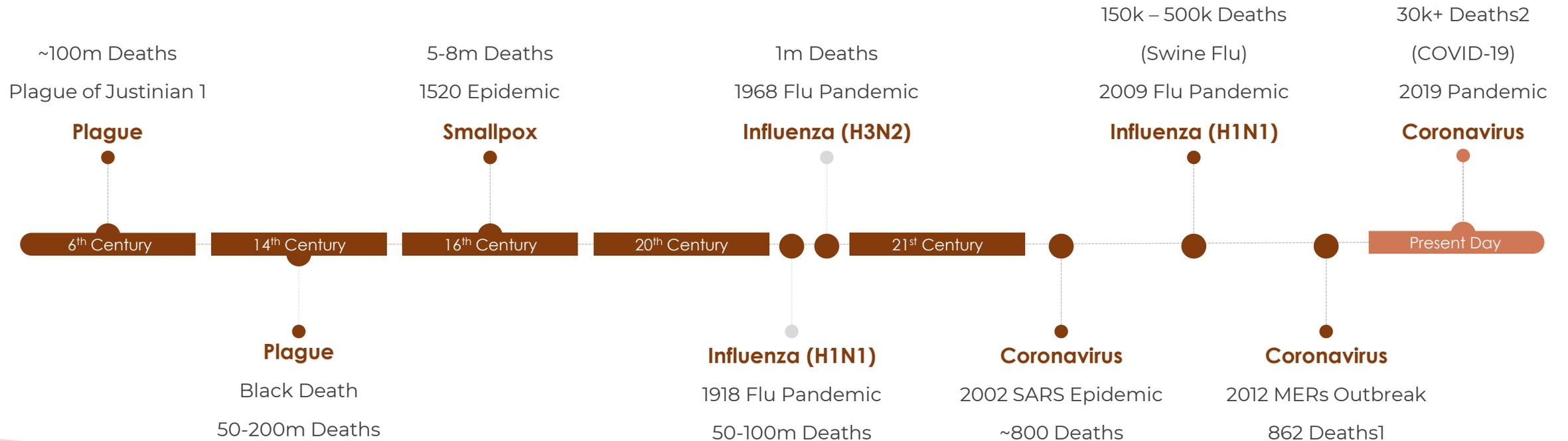
Action

Inspiring policies that will translate scientific knowledge into tangible human benefits

Impact

Developing a holistic view of present and future global healthcare systems

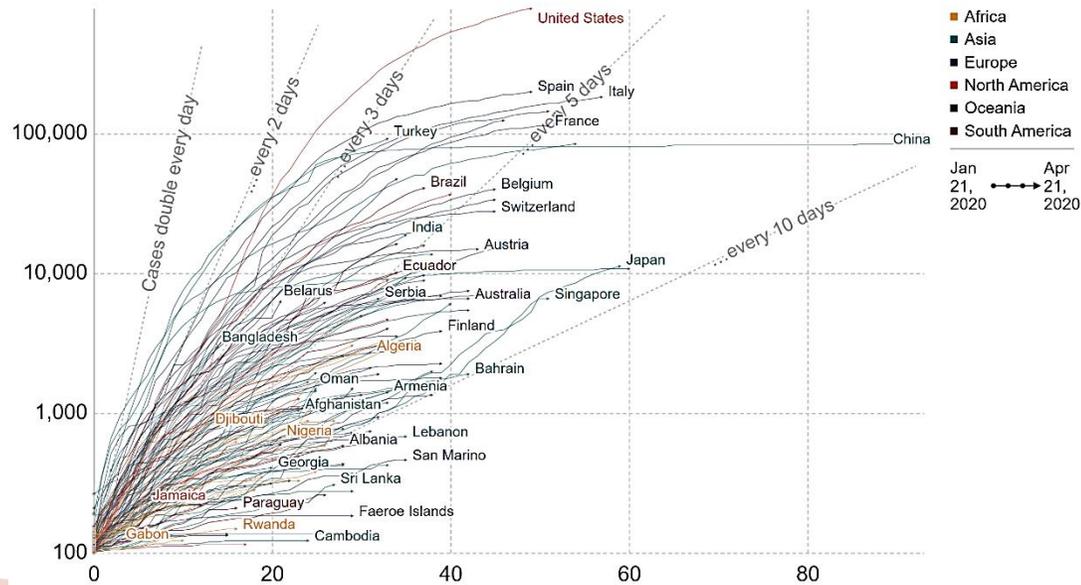
Future of Health – Challenges and Opportunities



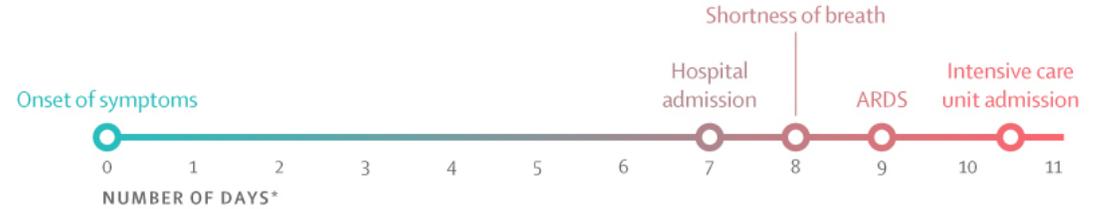
Nations cannot predict when the next infectious disease outbreak will occur and therefore must always be prepared

Future of Health – Challenges and Opportunities

185 countries have confirmed COVID-19 cases



Timeline of coronavirus onset



ARDS=Acute respiratory distress syndrome

*Median time from onset of symptoms, including fever (in 98% of patients), cough (75%), myalgia or fatigue (44%), and others.

THE LANCET

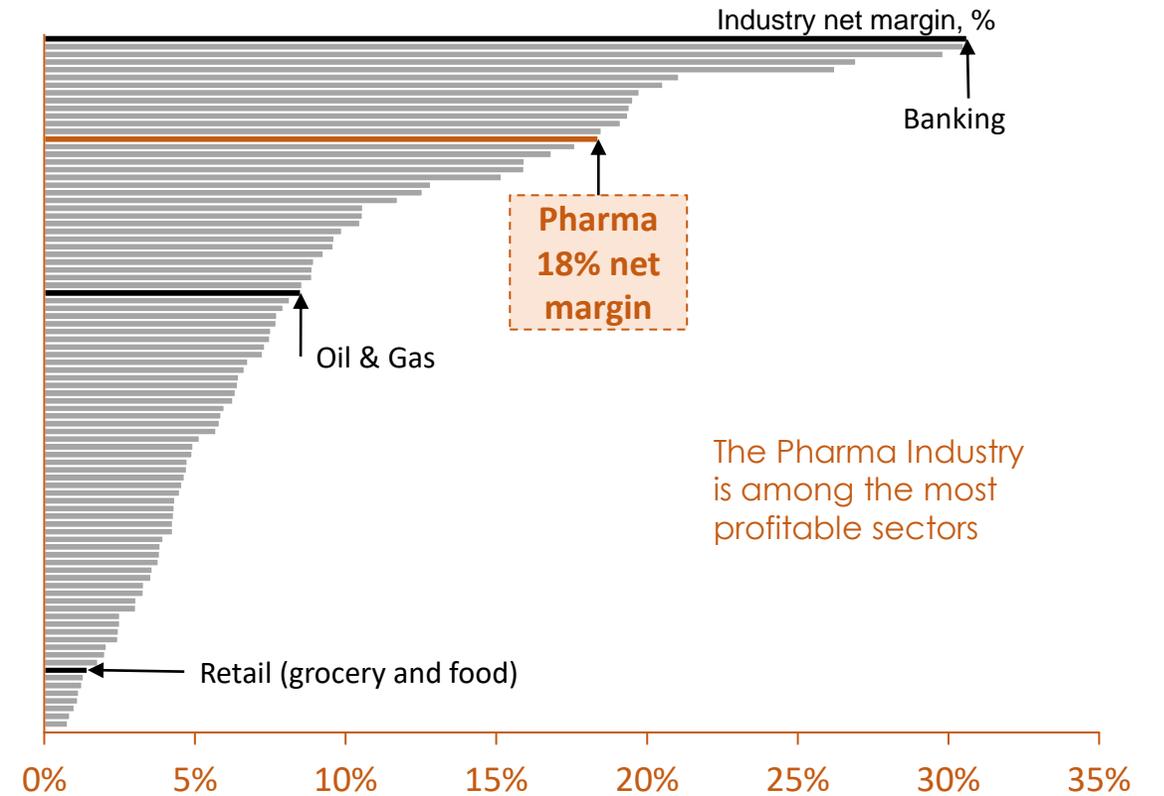
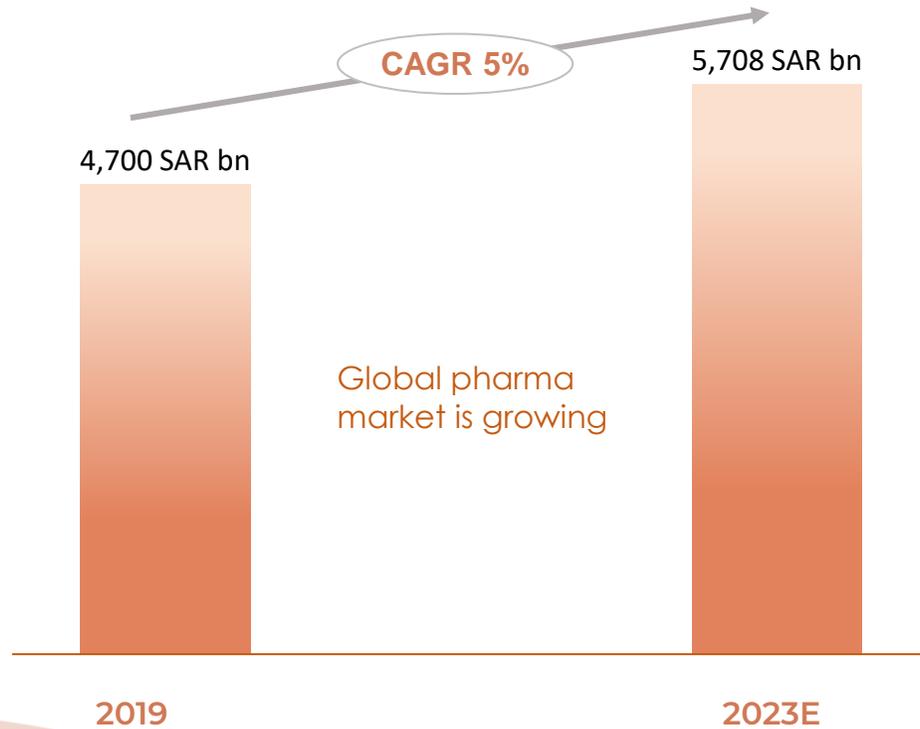


697 COVID-19 Studies from the WHO International Clinical Trials Registry Platform Database

Even countries with advanced healthcare systems can become overwhelmed by the sheer number of cases

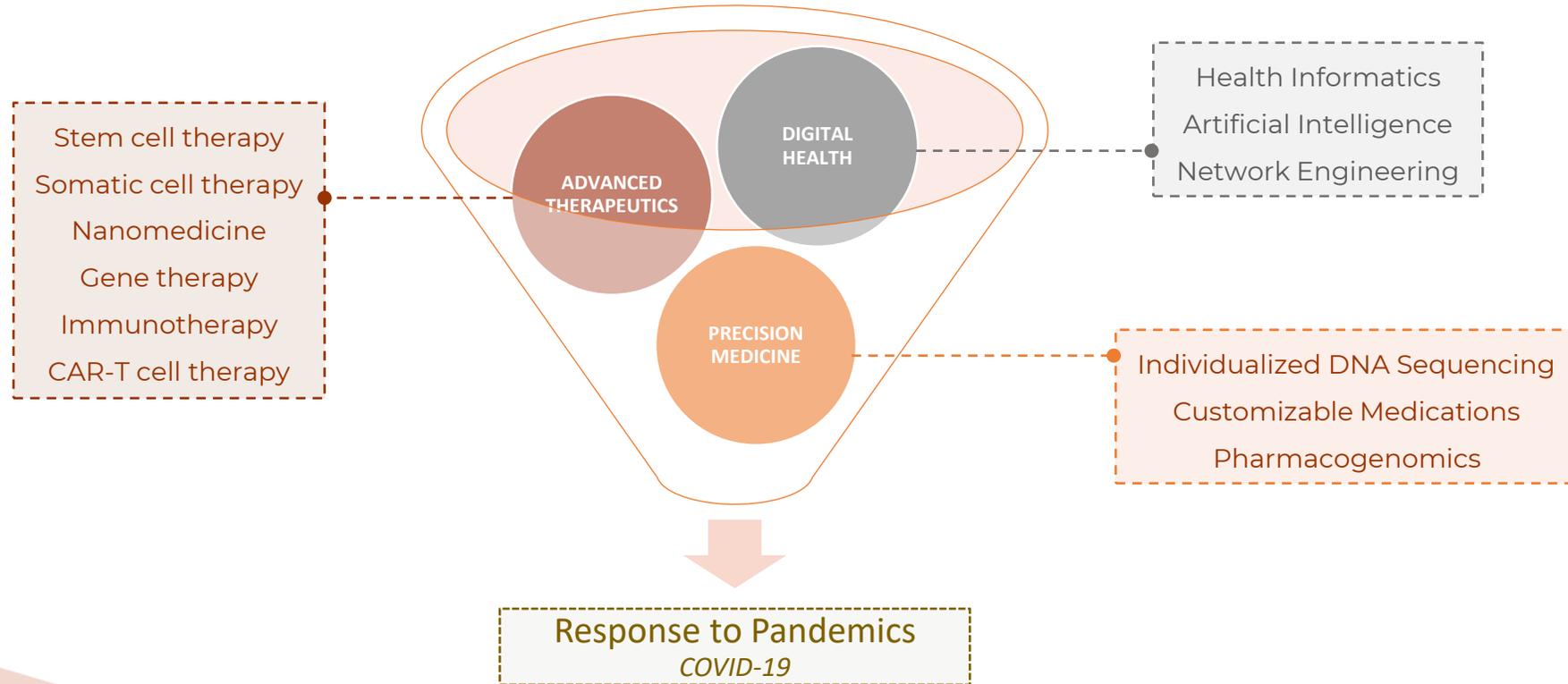
Sources: European CDC – Situation Update Worldwide
Business Insider: An animated map tracks the spread of the coronavirus as cases were reported in more than 180 countries

Future of Health – Challenges and Opportunities: Market growth



Pharmaceutical companies provide insight into market growth and opportunities in imperative development trend

Future of Health – Trends and Technologies



Science can prepare and support tomorrow's health care providers to rise to their fullest potential

Future of Health – Foresight

Preventing Pandemics and Expanding Personalized Healthcare

Key issues

- **Health** issues are complex and rapidly changing.
- Single-issue focus within **Health** is in many instances insufficient.

Issues to solutions

- Science can provide solutions on a wide array of **Future of Health** issues
- **Technological innovation** to enable Human Health solutions.
- **Foresight and policymaking** for the Future of Health.
- Using foresight methods to adopt solutions and encourage co-operation for the **Future of Health.**





Taskforce 2

Circular Economy:

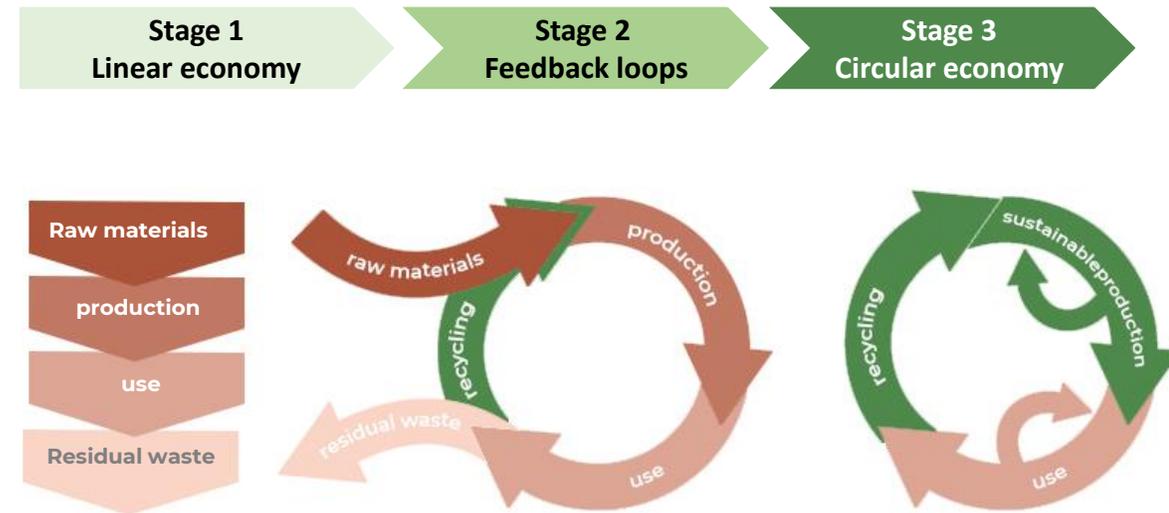
Holistic Solutions for our Environment



**SAUDI ARABIA 2020
SCIENCE**

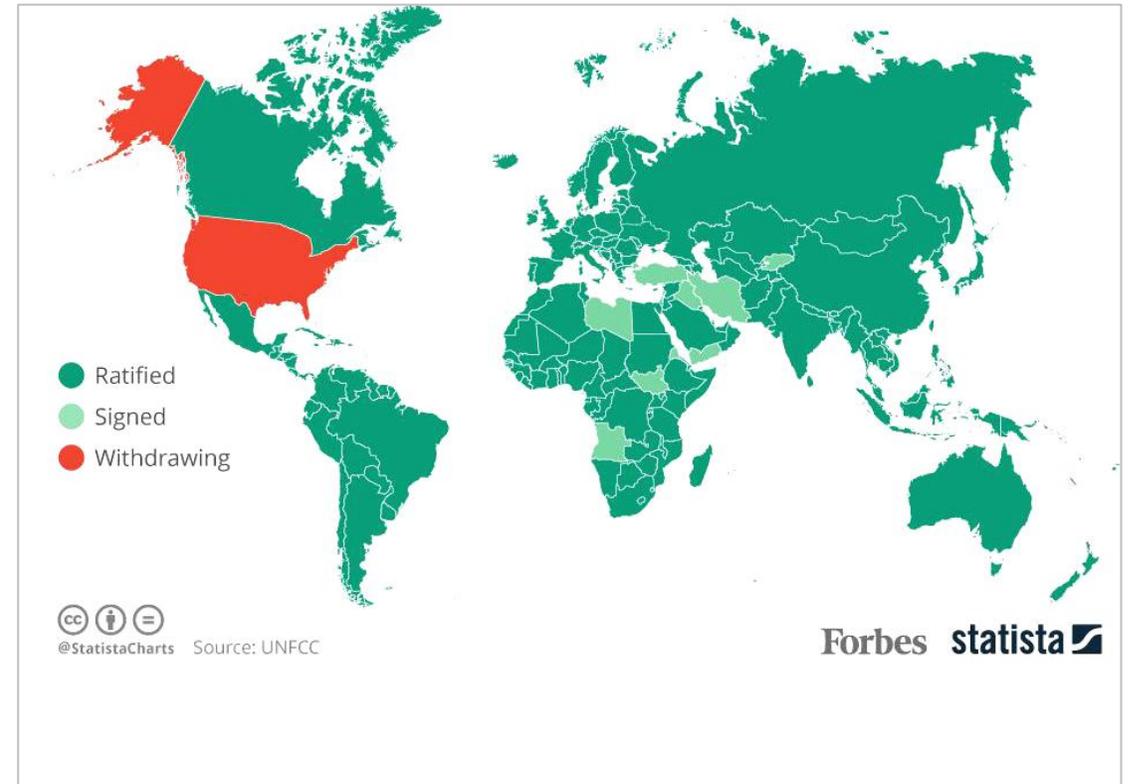
Circular Economy – What it means

- Holistic valuation of the social, economic and environmental costs of **resource utilization and waste production**
- Collaborative assessment of **scientific and technological** capacity for minimizing waste
- Call for multisector and multidisciplinary R&D aimed at designing systems that **minimize and utilize otherwise wasted by-products** from industry, agriculture and other sectors
- Provision of strategic and policy guidance to enable the **translation of science and technology into concrete solutions** for creating systems based on **circularity**



Circular Economy – Challenges and Opportunities

- Considering global resources like: Energy, Water, Food, Raw Materials, and Manufactured Products we can observe common patterns:
 - Uneven availability of the resources (Abundances and Shortages)
 - Global stress on the resource (Inefficient use and Overconsumption)
 - Utilization Aftermath (Toxic waste and resource Recycling)



Circular Economy – Challenges and Opportunities

Dealing with Uneven Availability of the resources

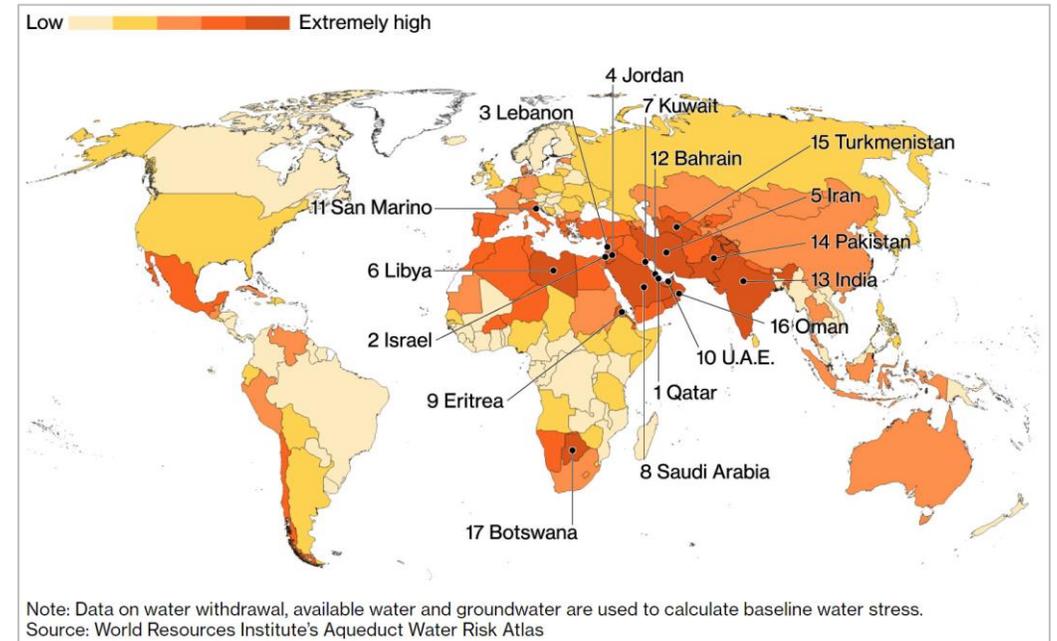
- Improved resources finding and extraction
- Enabling efficient global trade thru Information Technology & Communication
- Enabling efficient global transportation of energy, water, goods & services

Dealing with Global stress on the resources

- Enabling efficient resources utilization thru various technologies
- Enabling rational consumption thru information technology

Dealing with aftermath of resource utilization

- Technology to mitigate pollution from resource utilization
- Enabling neutralization of toxicity from waste
- Enabling safe & economic reuse of neutralized waste



Water stress indicator – Baseline water stress score, by region

Circular Economy – Trends and Technologies

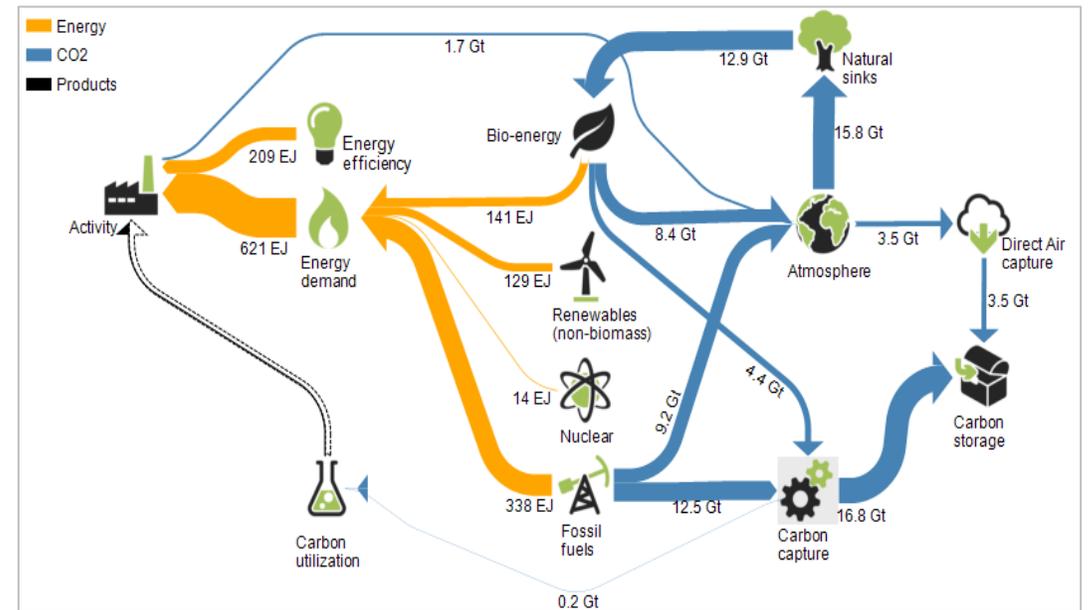
Energy: mixed-energy sources, fast tracking innovations in large-scale energy storage for renewables

Food and agriculture: urban food systems, scaling up alternative food source production, recycling waste for use as fertilizers, efficient methods of water use

Water: recycling and reuse of sewage and wastewater, global initiatives to reduce waste in the environment

Materials and manufacturing: innovations in e-waste processing to drive reuse, biodegradation and compost management, circular by design manufacturing

Others - lessons from COVID-19: sustainable consumption



Circular Carbon Economy

Circular Economy – Foresight

Holistic Solutions for our Environment

Key issues

- **Circular Economy issues are** complex and rapidly changing in unpredictable ways.
- Single-issue focus within **Circular Economy** is in many instances insufficient.

Issues to solutions

- Foresight and policymaking for **Circular Economy**
- Technological innovation for sustainability to support the **Circular Economy**.
- **Using foresight methods to adapt development co-operation for the future**
- **Science can provide solutions on a wide array of issues**





Taskforce 3

Digital Revolution:

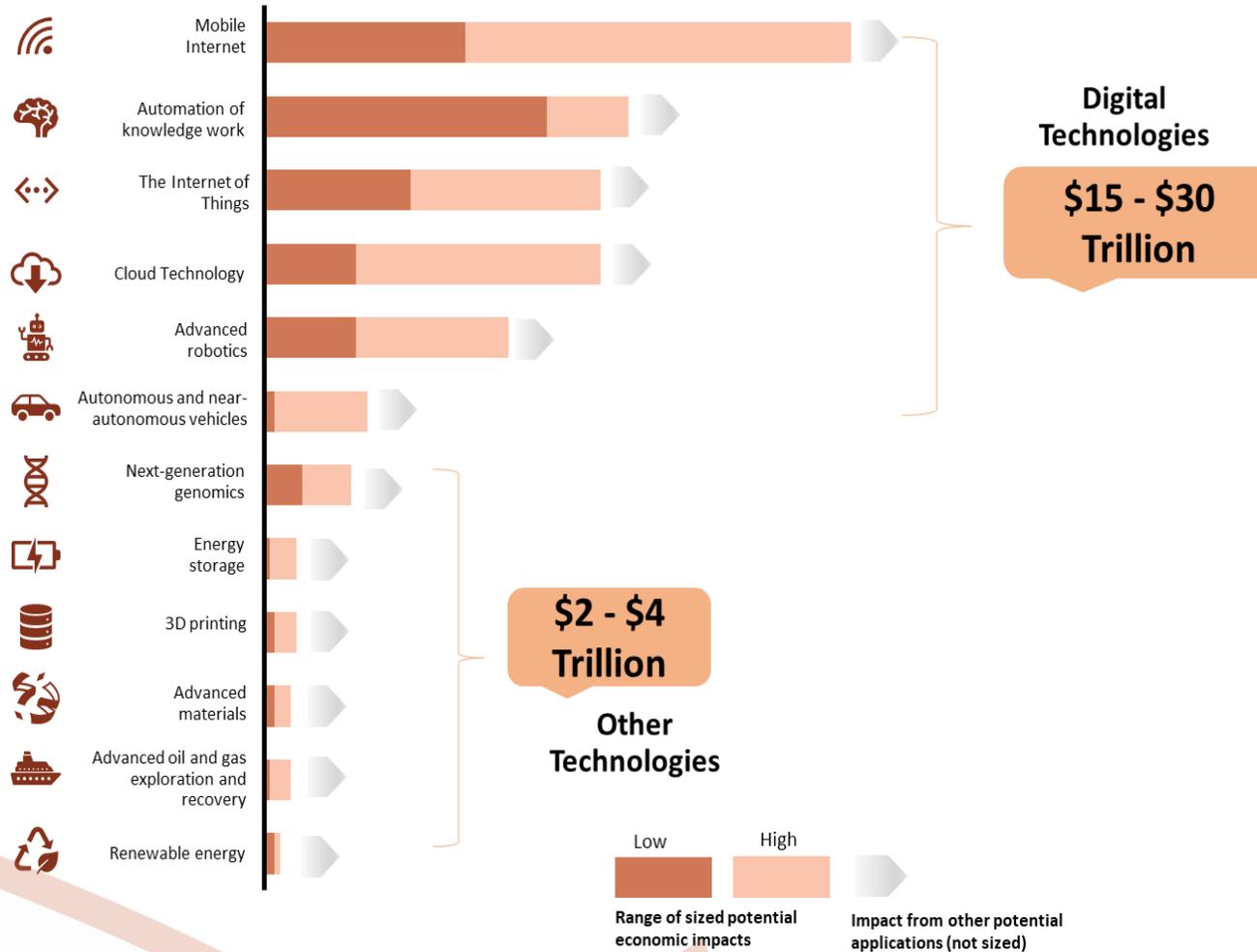
Achieving Universal Connectivity and Smarter Communities

Digital Revolution – What it means

- Achieving universal connectivity of people, organizations, machines, businesses, devices, data and processes
- Interaction of people with the Internet, the Internet of Things (IoT), robotics, ...
- Utilize advanced tools (AI, Big data, blockchain) for smarter communities
- Must deliver benefits BUT ALSO protect people

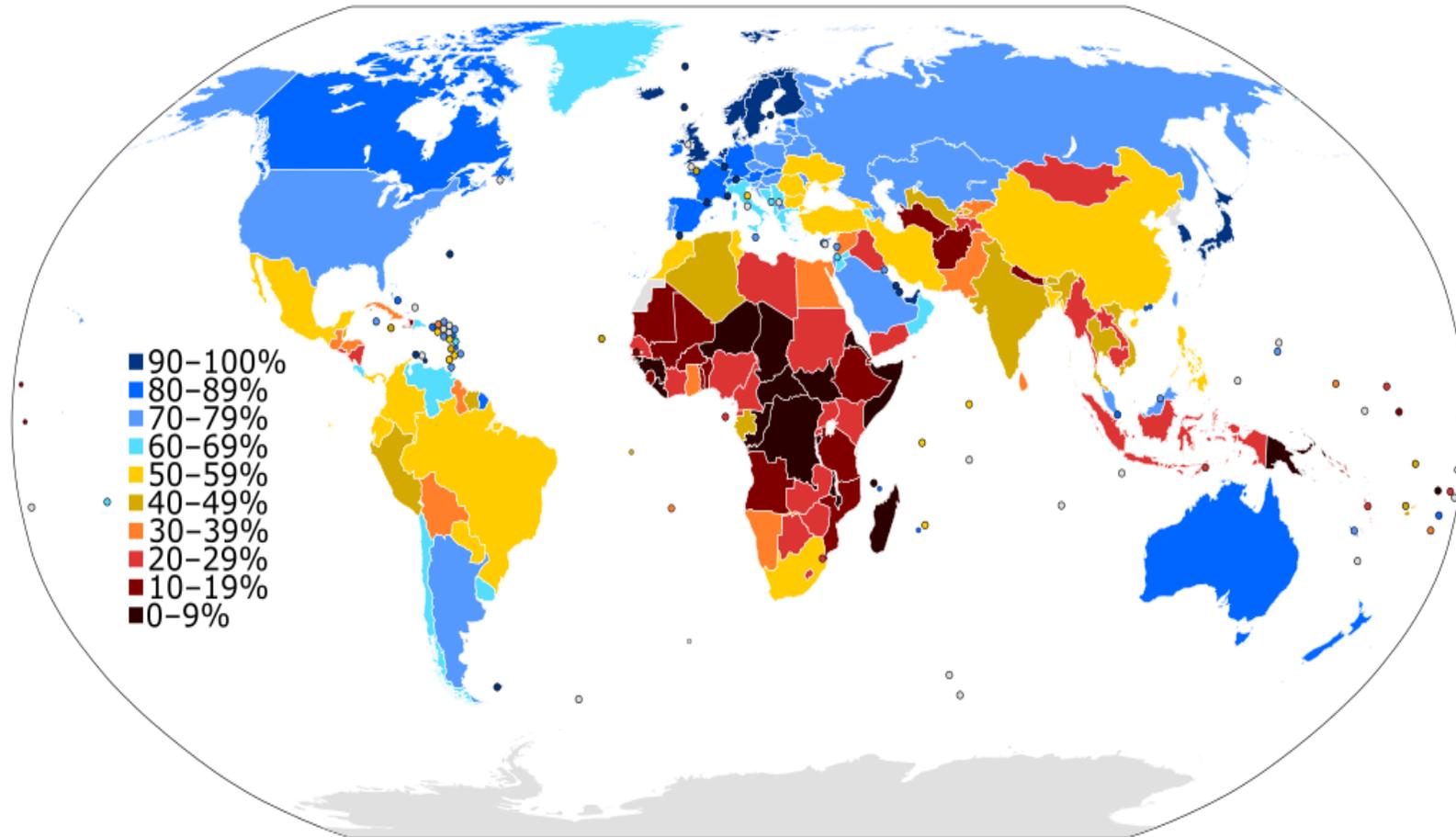


Digital Revolution – Challenges and Opportunities



Digital technologies have relatively high impact as compared to other technologies

Digital Revolution – Challenges and Opportunities



Major Challenge: A major digital divide

Digital Revolution – Trends and Technologies

6G & Beyond: Connecting & Hyper-connecting

Impact:

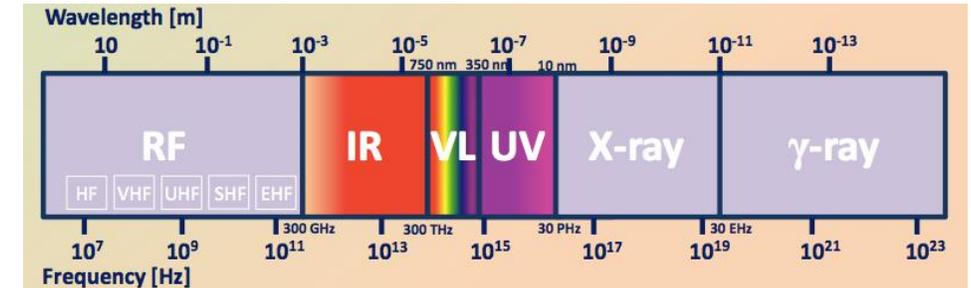
- Highest Economic impact: \$4-\$10 Bn

Technology

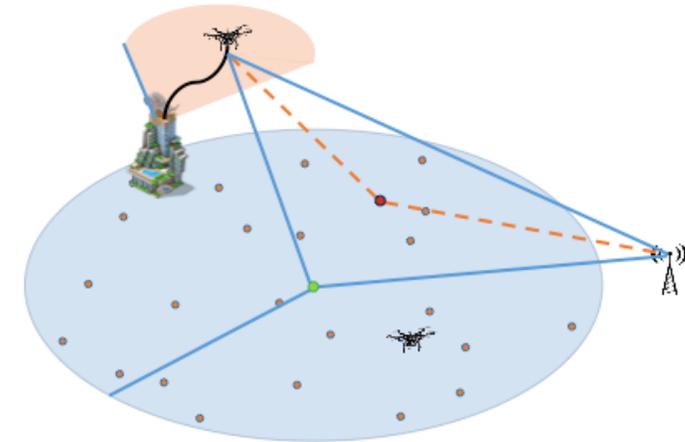
- Extreme communications
- Ultra reliable/low latency applications
- Improved propagation channels
- Airborne networks
- High-throughput satellites

Issues

- Incentives/policies to bridge the divide
- Research/regulations reg. EM exposure



Large spectrum in the THz and Visible Light Bands



Airborne Terrestrial Networks

Digital Revolution - Trends and Technologies

From IoT to the IoXT

Impact:

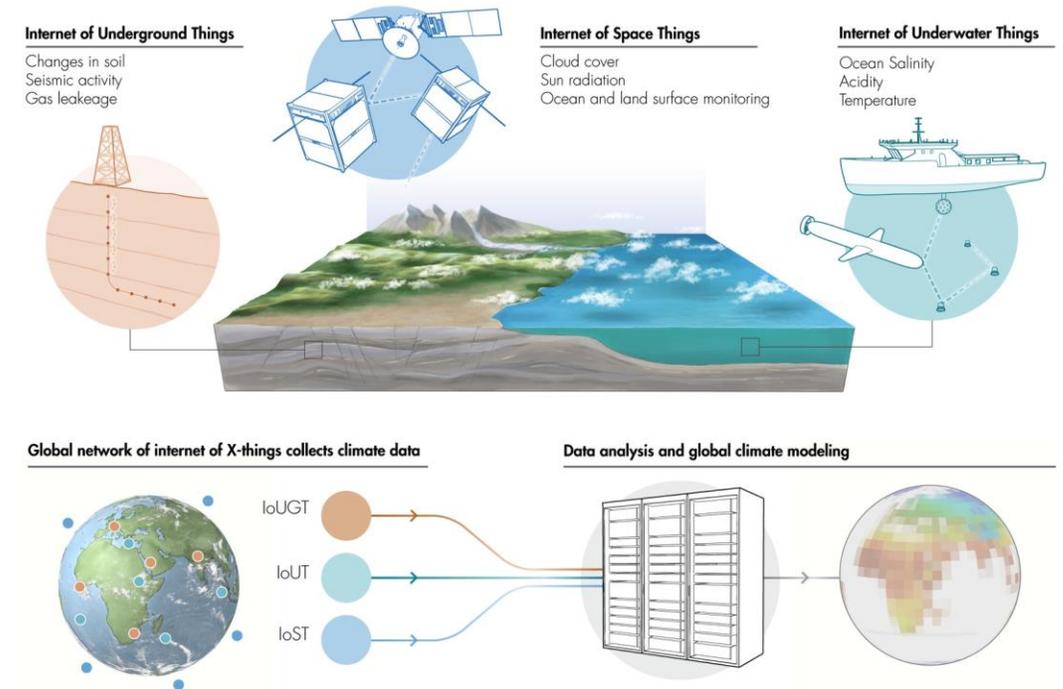
- 100's of millions in R&D funding
- 1 Trillion Sensors by 2025

Technology

- Industrial sector/smart home
- Network of thermostats tracks Flu/Corona virus (nytimes)
- Internet of X-things (space/underground/underwater)

Issues

- Collaborative policies for using IoXT to study climate



Digital Revolution - Trends and Technologies

AI, Robotics, Smart Communities, ...

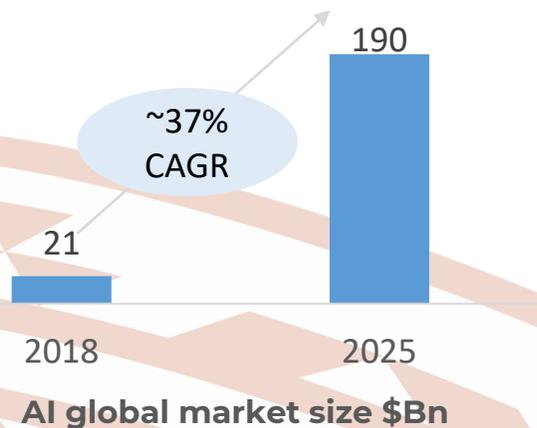
Big Data & AI

Impact

- Most disruptive technology
- Multi billions of R&D spending

Issues

- Human centric AI?



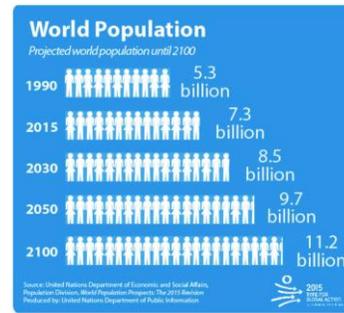
Smart Communities?

Impact

- Increasing Population (9.7 Bn by 2050)
- 2/3 population in urban areas

Issues

- Security & privacy



Other technologies

Quantum computing

- Threat to public key encryption
- Need quantum-safe encryption

DNA Storage

- Ethical & consent issues in the use of human biological materials for research

Big data & Blockchain

- Policy to protect citizens rights without stifling innovation
- Define authoritative bodies

Digital Revolution – Foresight



Global Connectivity



IoXT and AI



Robotics & Smart Communities



Digital Revolution – Foresight

Achieving Universal Connectivity and Smarter Communities

Key issues

- **Digital Revolution** issues are complex and rapidly changing in unpredictable ways.
- Single-issue focus within **Digital Revolution** is in many instances insufficient.

Issues to solutions

- Science can provide solutions on a wide array of **Digital Revolution** issues
- Technological innovation to accelerate the **Digital Revolution.**
- Foresight and policymaking to enable the **Digital Revolution.**
- Using foresight methods to adopt solutions and encourage co-operation for the **Digital Revolution.**





Taskforce 4

Connecting the Dots:

From Science to Action

Connecting the Dots – What it means

- Empowering People
- Safeguarding the Planet
- Shaping New Frontiers



Future of Health



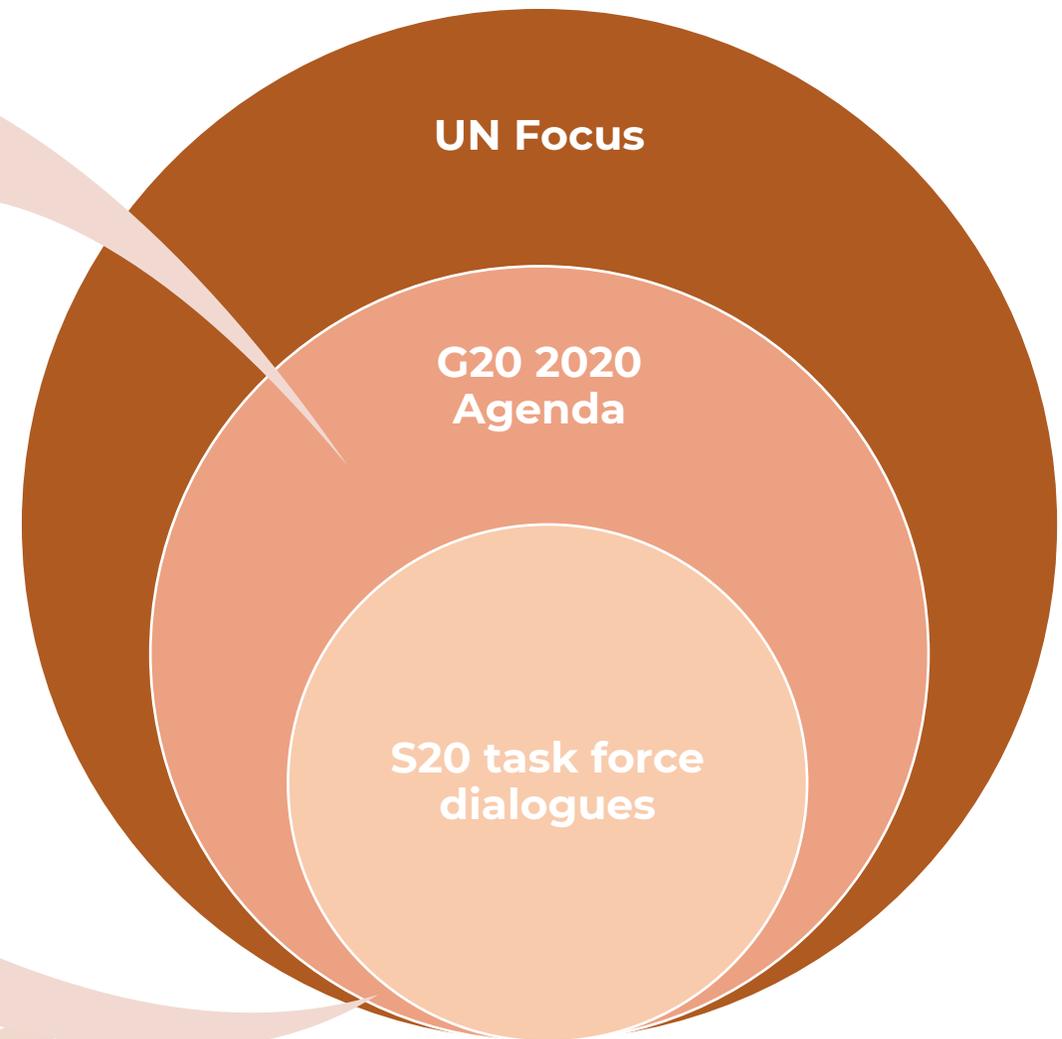
Circular Economy



Digital Revolution

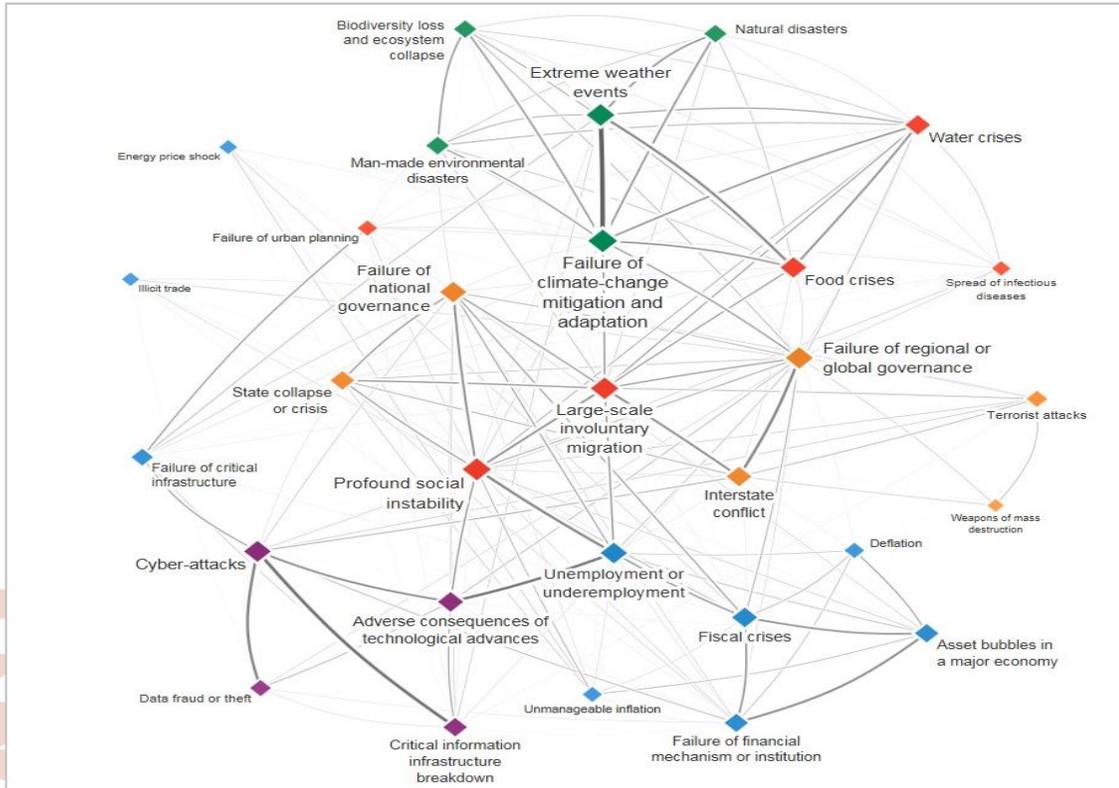


Connecting the Dots
from Science to Action



Connecting the Dots – Challenges and Opportunities

Global Risks are highly interconnected



Global Risks Interconnections Map 2019, WEF

Covid-19 shows risk in a highly connected world

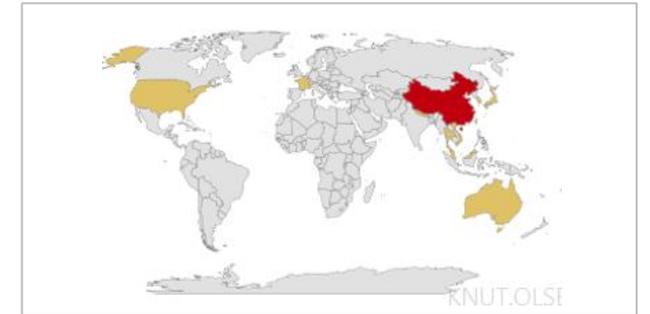
**Week 0 – 31st
December 2019**

China reports first cases



**Week 3 - 22nd
January 2020**

11 countries outside China



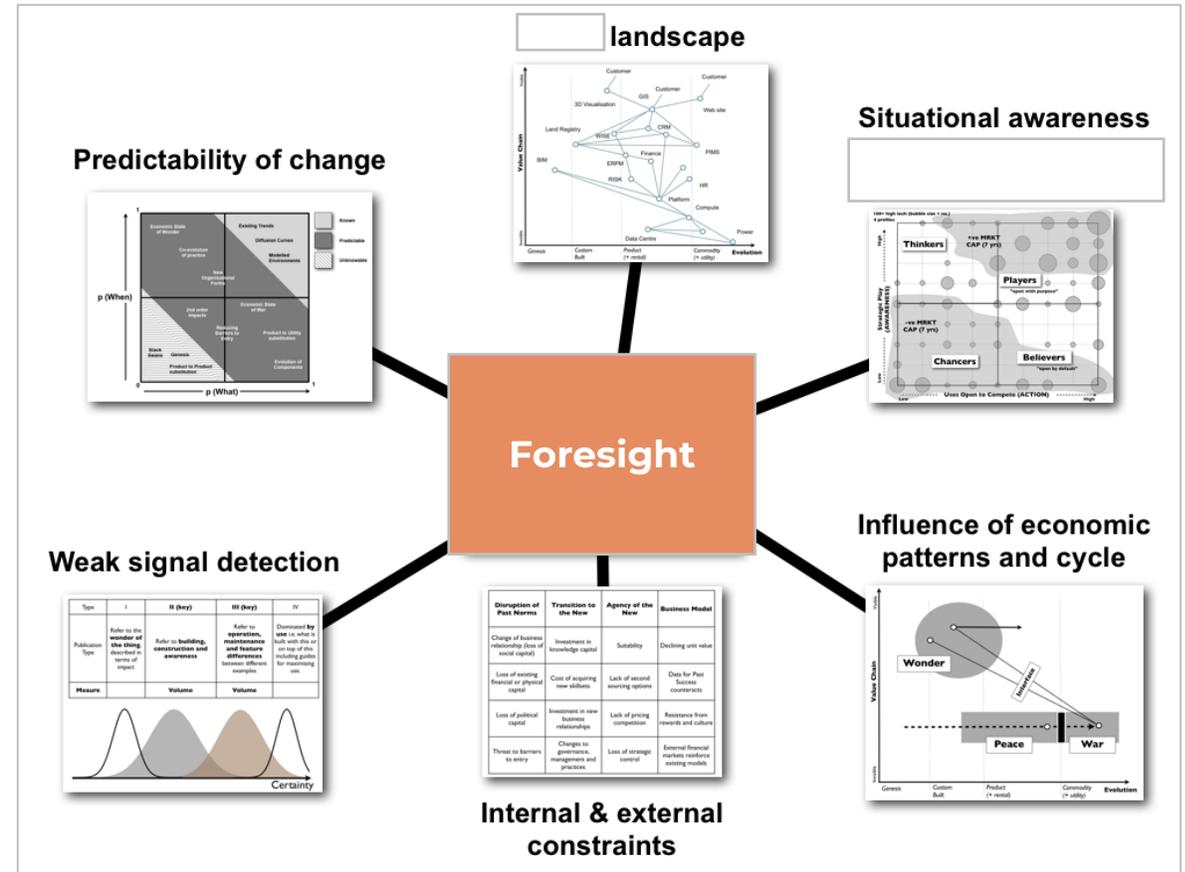
**Week 6 - 12th
February 2020**

25 countries outside China



Connecting the Dots – Trends and Technologies

- Significant ramifications on **future of health**
- **Circular designs** for energy, food, water and materials
- Human interactions with the environment and **infectious disease outbreaks** (e.g., COVID-19)



Connecting the Dots – Trends and Technologies

Unified Health Systems in Smart Connected Cities

Digital Communication

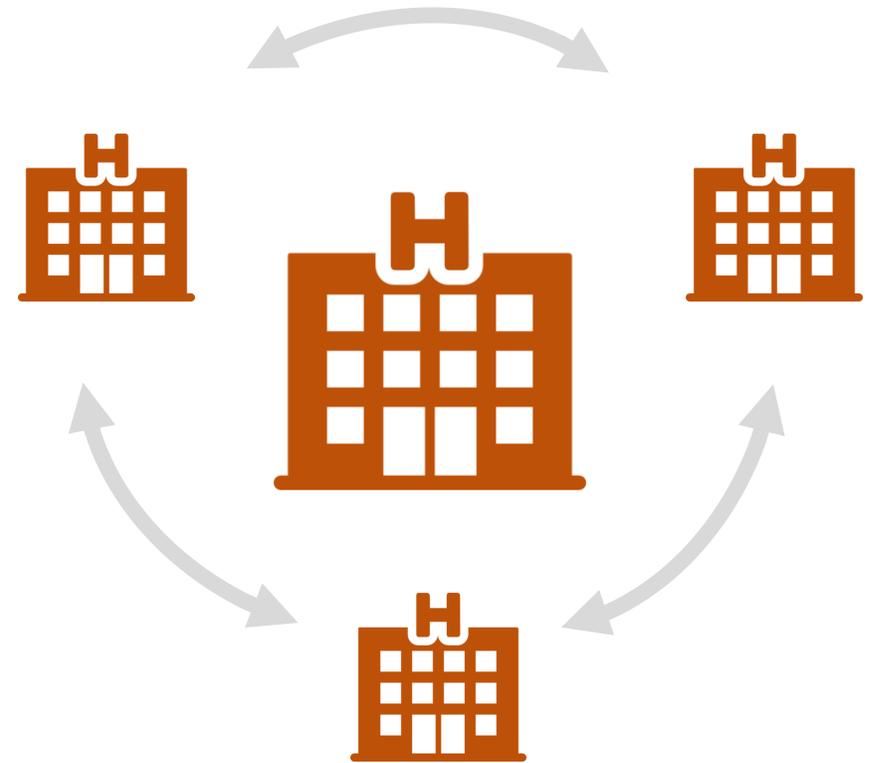
→ Better diagnosis through AI

Distant consultation

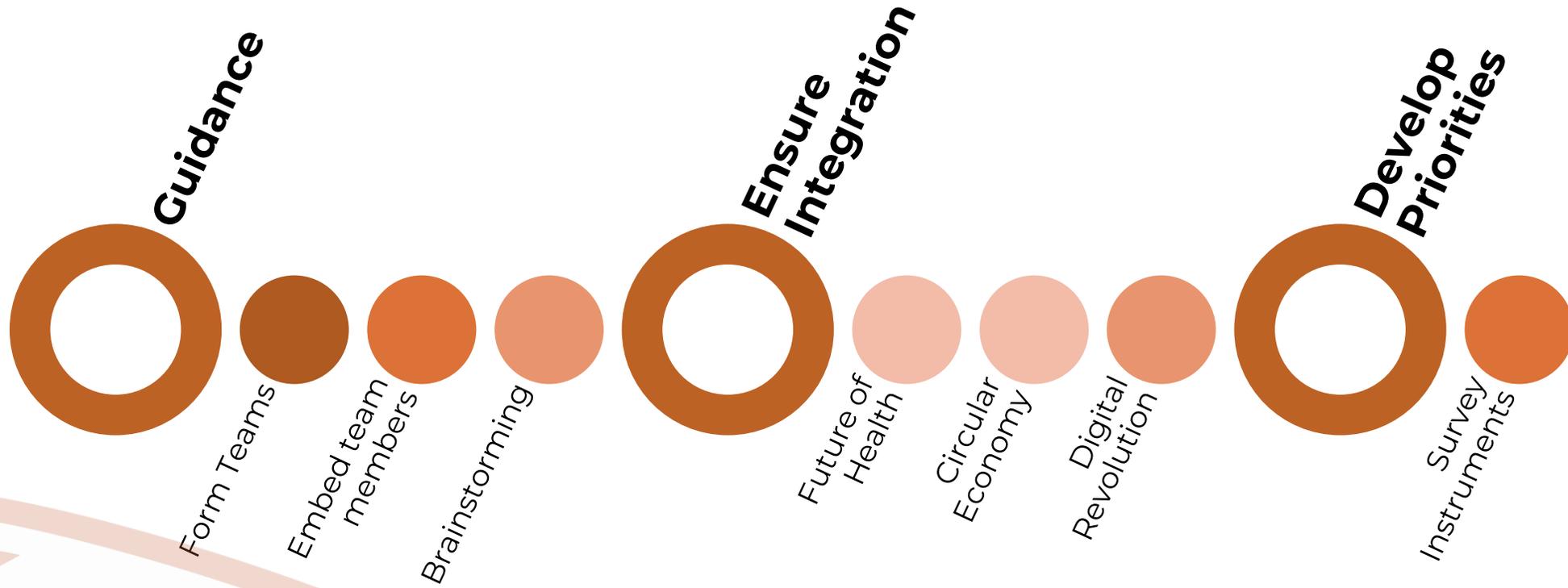
→ Less energy for travel

Advanced Robotics

→ Precise procedures and operations



Connecting the Dots – Foresight



Connecting the Dots – Foresight

From Science to Action

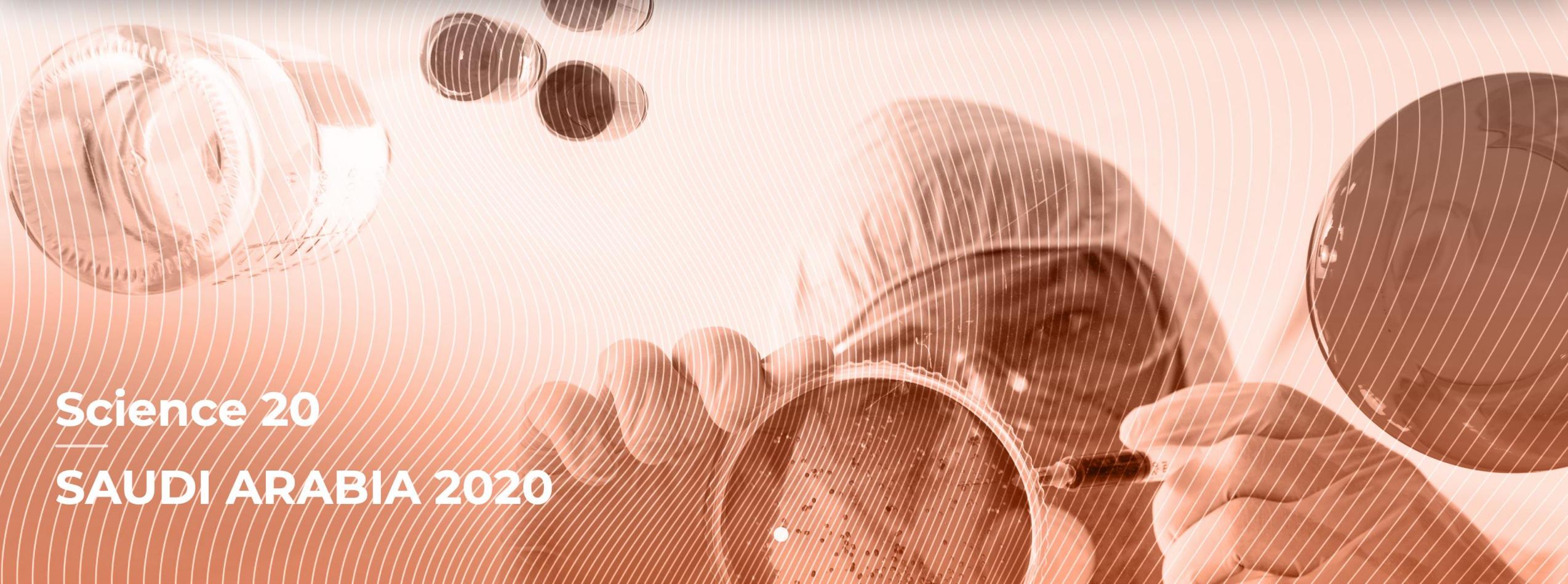
Key issues

- **Future of Health, Circular Economy and Digital Revolution** issues are complex, interconnected and rapidly changing in unpredictable ways.
- Single-issue focus within **Future of Health, Circular Economy** and **Digital Revolution** is in many instances insufficient.

Issues to solutions

- Science can provide solutions on a wide array of **Connecting the Dots** issues
- Technological innovation to accelerate **Connecting the Dots**.
- Foresight and policymaking to enable **Connecting the Dots**.
- Using foresight methods to adopt solutions and encourage co-operation for **Connecting the Dots**.

Governments increasingly realize that few contemporary challenges can be confined to one policy area and that a single-issue focus is in many instances insufficient*



Science 20

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S20 ADVOCACY

Science 20

SAUDI ARABIA 2020



Yara Al-Rajeh

Chief Advocacy Officer, S20 2020

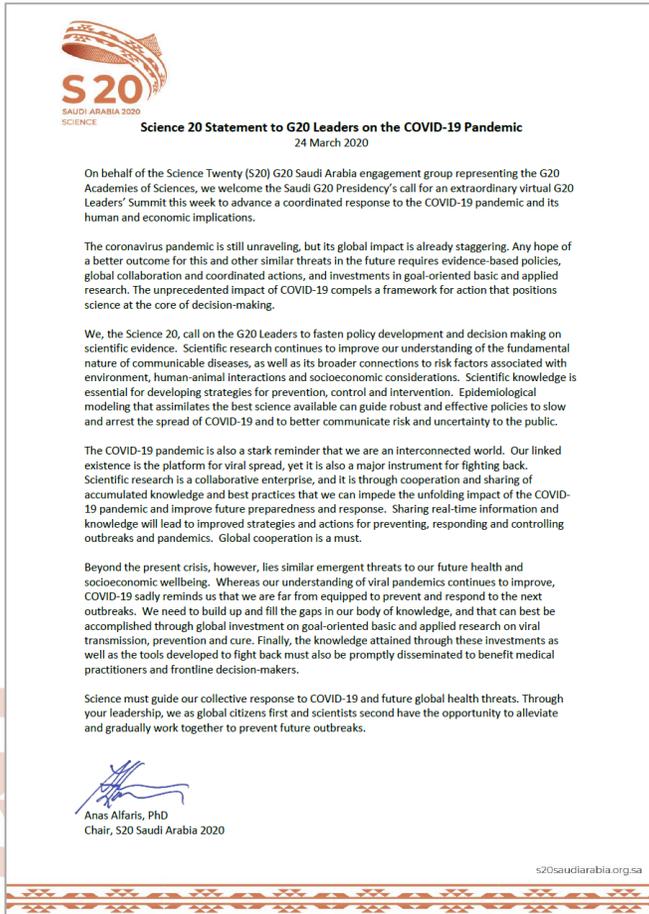
Senior Consultant, King Abdulaziz City for Science and Technology



SAUDI ARABIA 2020
SCIENCE

Advocacy

S20 Statement on COVID-19



Called for action on three main fronts:

- Fasten policy development and decision making on **scientific evidence**
- **Global scientific cooperation** and sharing of accumulated knowledge and best practices
- **Investment in goal-oriented basic and applied research** on viral transmission, prevention and cure

Extraordinary G20 Leaders' Summit Statement on COVID-19

G20 Leaders' Statement

Extraordinary G20 Leaders' Summit
Statement on COVID-19



everyone, especially vulnerable groups that are disproportionately affected by infectious diseases. We further commit to work together to increase research and development funding for vaccines and medicines, leverage digital technologies, and strengthen scientific international cooperation. We will bolster our coordination, including with the private sector, towards rapid development, manufacturing and distribution of diagnostics, antiviral medicines, and vaccines, adhering to the objectives of efficacy, safety, equity, accessibility, and affordability.

We ask the WHO, in cooperation with relevant organizations, to assess gaps in pandemic preparedness and report to a joint meeting of Finance and Health Ministers in the coming months, with a view to establish a global initiative on pandemic preparedness and response. This initiative will capitalize on existing programs to align priorities in global preparedness and act as a universal, efficient, sustained funding and coordination platform to accelerate the development and delivery of vaccines, diagnostics and treatments.

Safeguarding the Global Economy

We commit to do whatever it takes and to use all available policy tools to minimize the economic and social damage from the pandemic, restore global growth, maintain market stability, and strengthen resilience.

We are currently undertaking immediate and vigorous measures to support our economies; protect workers, businesses—especially micro-, small and medium-sized enterprises—and the sectors most affected; and shield the vulnerable through adequate social protection. We are injecting over \$5 trillion into the global economy, as part of targeted fiscal policy, economic measures, and guarantee schemes to counteract the social, economic and financial impacts of the pandemic.

We will continue to conduct bold and large-scale fiscal support. Collective G20 action will amplify its impact, ensure coherence, and harness synergies. The magnitude and scope of this response will get the global economy back on its feet and set a strong basis for the protection of jobs and the recovery of growth. We ask our Finance Ministers and Central Bank Governors to coordinate on a regular basis to develop a G20 action plan in response to COVID-19 and work closely with international organizations to swiftly deliver the appropriate international financial assistance.

We support the extraordinary measures taken by central banks consistent with their mandates. Central banks have acted to support the flow of credit to households and businesses, promote financial stability, and enhance liquidity in global markets. We welcome the extension of swap lines that our central banks have undertaken. We also support regulatory and supervisory measures taken to ensure that the financial system continues to support the economy and welcome the Financial Stability Board's (FSB) announced coordination of such measures.

We also welcome the steps taken by the IMF and the WBG to support countries in need using all instruments to the fullest extent as part of a coordinated global response and ask them to regularly update the G20 on the impacts of the pandemic, their response, and policy recommendations. We will continue to address risks of debt vulnerabilities in low-income countries due to the pandemic. We also ask the International Labour Organization (ILO) and the Organisation for Economic Cooperation and Development (OECD) to monitor the pandemic's impact on employment.

“ The virus respects no borders. Combatting this pandemic calls for a transparent, robust, coordinated, large-scale and science-based global response in the spirit of solidarity. We are strongly committed to presenting a united front against this common threat. ”

“ We further commit to work together to increase research and development funding for vaccines and medicines, leverage digital technologies, and strengthen scientific international cooperation. ”

Engagements with G20 Working Groups



- Health Working Group
- Environment Working Group
- Energy Working Group
- Digital Economy Taskforce
- Development working Group

General S20 related Advocated messages



- Use of expert, evidence-based advice and assessment
- Sharing of knowledge and information gained through scientific multinational collaborations
- Capacity building for research infrastructure and human capital
- Applying existing and emerging scientific knowledge
- More...

Moving Forward



G20 Engagements to target

- **June 14 – 15** 2nd Environment Deputies Meeting
- **June 17-18** 2nd Development Working Group Meeting
- **June 26 – 27** Agriculture Ministers Meeting
- **July 22 – 23** Digital Economy Ministers Meeting
- **Sept 5** Education Ministers Meeting
- **Sept 16** Environment Ministers Meeting

Special S20 statements might be issued to target certain G20 calendar events

Moving Forward



Engagement Groups

- Shared B20, W20, C20, S20 Joint Statement

S20 Troika Engagement

- Promote continuity



S20 International Organizations

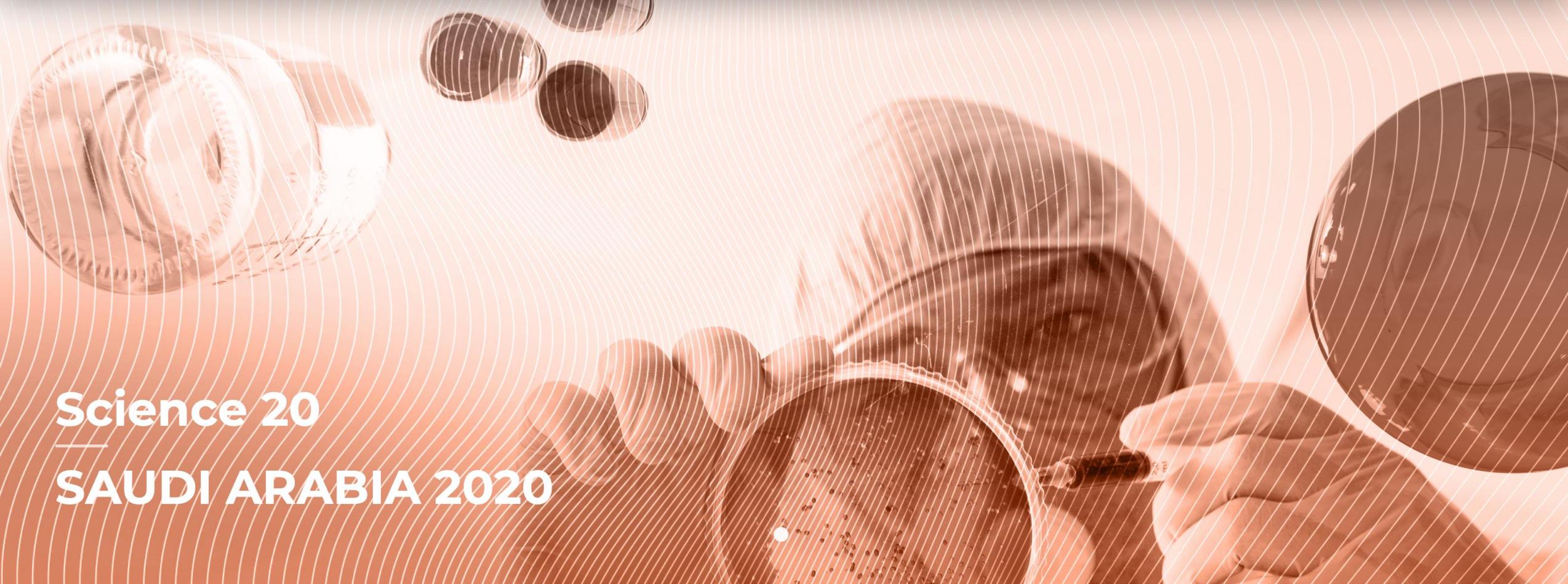
- Engage the wider science community. Build partnerships local and int'l.

Moving Forward



S20 Initiatives

- **S20 Report:** A full report on the S20 theme that captures the S20 dialogue and outcomes of the S20 theme.
- Several Initiatives including a proposed **Action Board**



Science 20

SAUDI ARABIA 2020

Q&A SESSION

Q&A SESSION

Future of Health



Aws Alshamsan, PhD

Professor and Dean of College
of Pharmacy, King Saud
University

Circular Economy



Yousef Al-Yousef, PhD

Professor and VP of Research
Institutes, King Abdulaziz City
for Science and Technology

Digital Revolution



Tareq Al-Naffouri, PhD

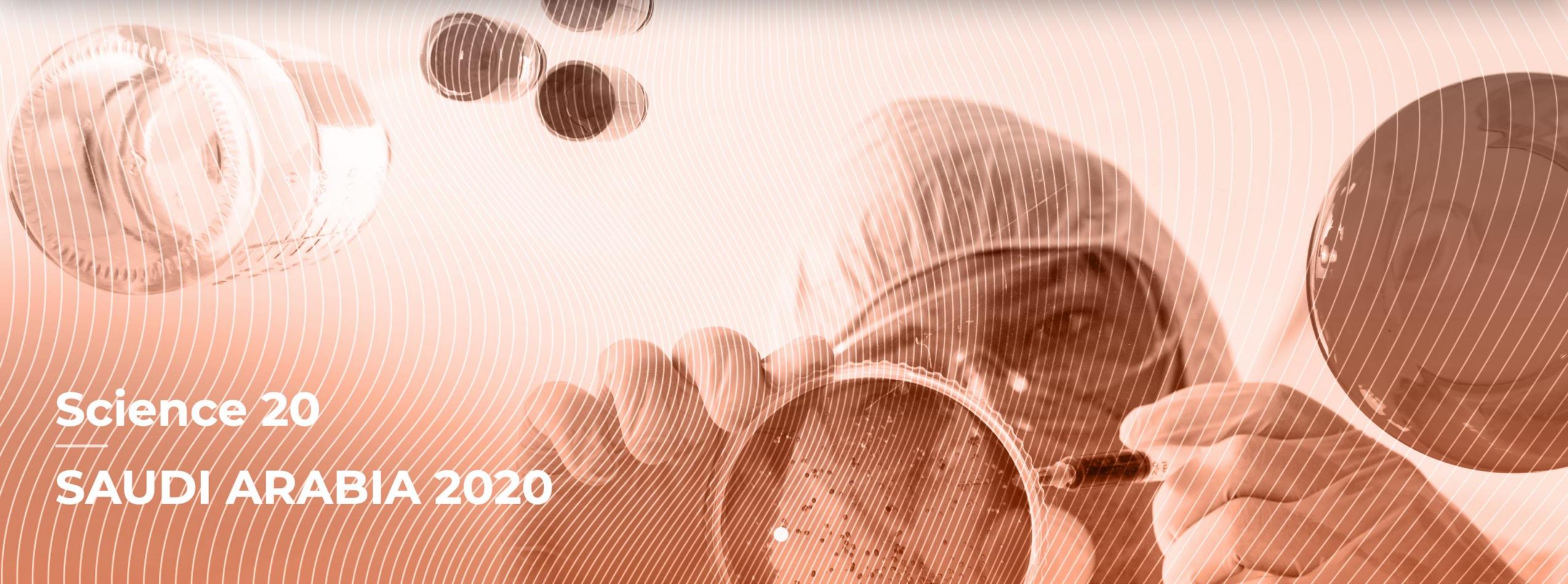
Professor, Electrical
Engineering, King Abdullah
University of Science and
Technology

Connecting the Dots



Ali A. Al-Meshari, PhD

Lead, Upstream Research and
Development, Saudi Aramco



Science 20

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CONCLUDING REMARKS