



Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Towards Dynamic Resilience in Health System Performance and Reform - Resilience to Reform (RESTORE)

Systematic Review of Measures / Metrics of Health Systems Resilience Nov 16th 2021

Dr Pádraic Fleming
TCD Centre for Health Policy and Management

Review team & collaborators: Catherine O'Donoghue,
Steve Thomas, Arianna Almirall-Sanchez, David Mockler,
Conor Keegan, Jon Cylus, wider research team and
international advisory panel



RESTORE:
Resilience
to Reform

Review Question: What type of metrics and indicators have been used to assess and measure 'Health System Resilience' in relation to a shock, crisis or sudden change which has occurred to a health system?

Why do this review?

- It helps identify feasible measures of resilience that have been used
- It focuses health systems on potential strategies to improve these metrics and build resilience
- It highlights potential weaknesses of health systems experiencing shocks allowing preventive action.

Articles included: up to 18 February 2021

Databases: EMBASE, CINAHL, MEDLINE, Web of Science

Inclusion Criteria

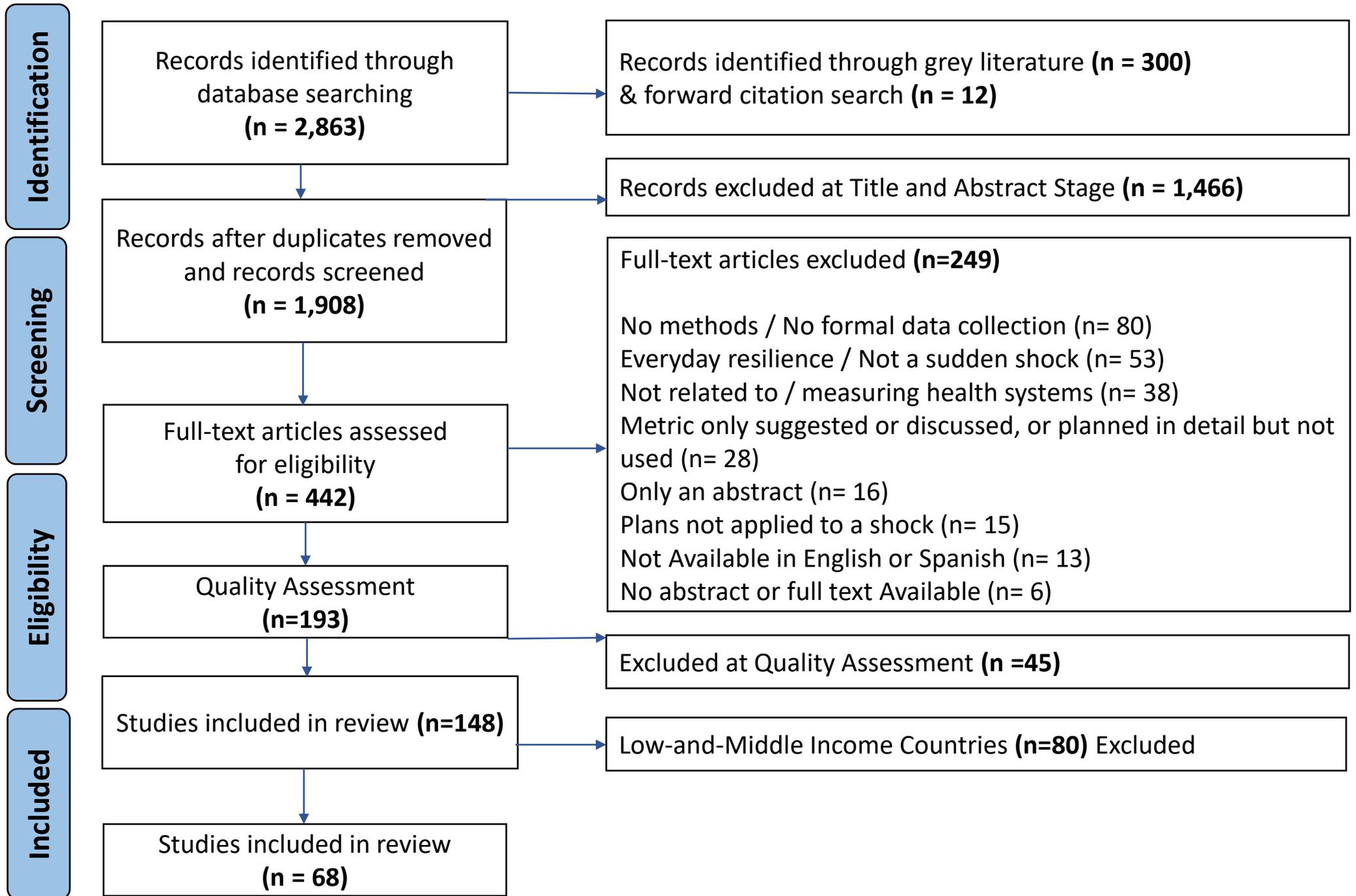
- Studies must have collected data and made an analysis of the data in relation to assessing health system resilience.
- English and Spanish articles

Exclusion Criteria

- Metrics or Indicators have only been Suggested/Discussed/Recommended.
- Only Measures 'Everyday' Resilience / Not related to a Health System

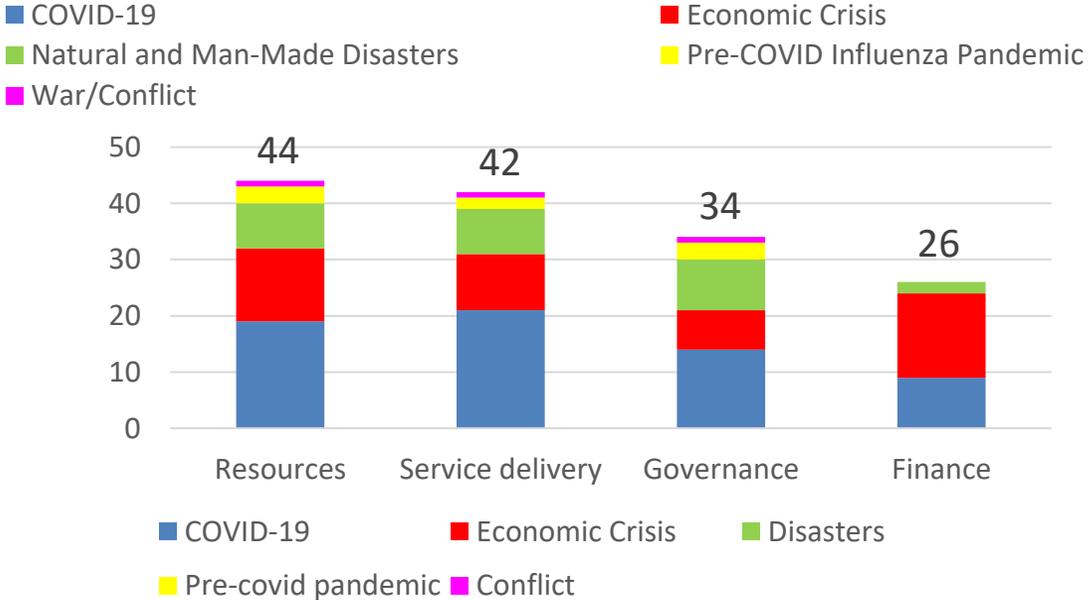
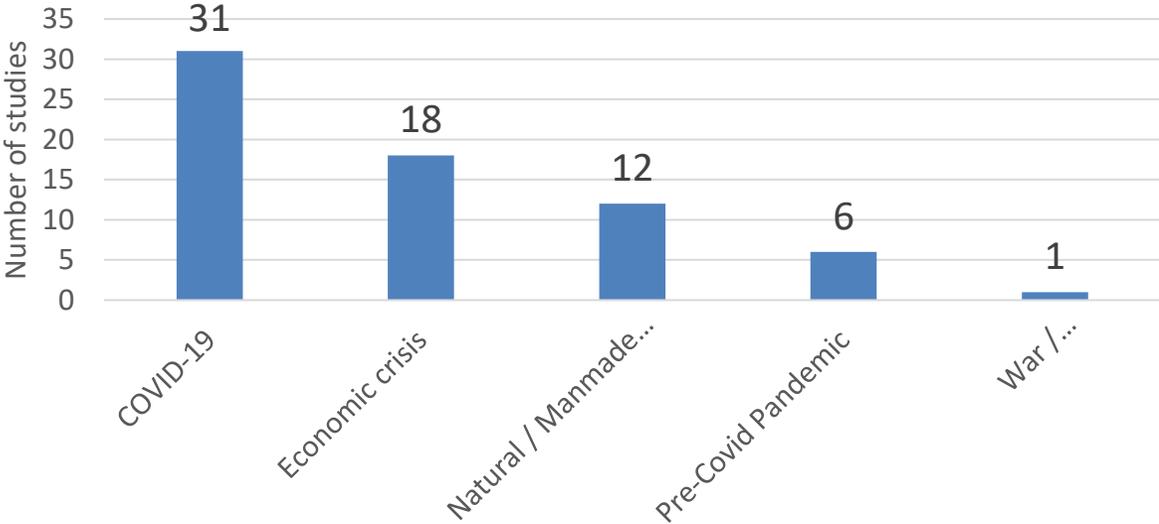
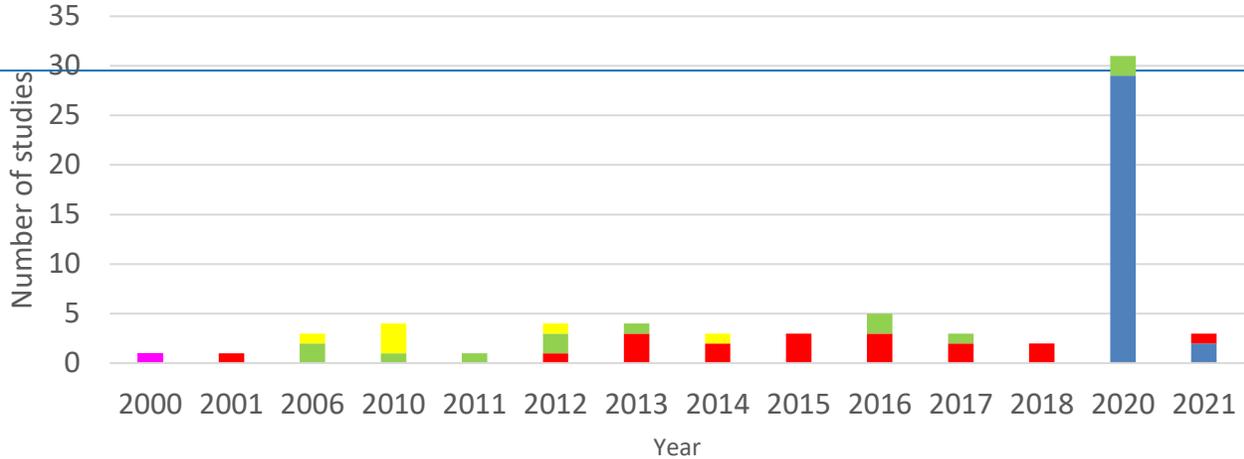
Quality Assessment Checklist

Adapted from CASP, JBI, MMAT and NIH



Study characteristics

Region	No. of Studies	%
Europe	32	47%
North America	18	26%
Asia	6	9%
Mix / Multiple	6	9%
Australasia	4	6%
Middle East	1	1%
South America	1	1%



Metrics and Indicators – Resources (n = 44)

Absolute Measures

- Staff headcount - Doctor and Nurse's
- Hospital and ICU beds
- Per 100,000 pop. or per 1000 pop
- Compared regionally or national averages, EU average, OECD average.

Study Example: Preparedness of a Health System

Japanese Earthquake 2011

Fukushima was 'medically underserved' with fewer physicians, nurses, ambulance calls and clinics per 100,000 residents than the Japanese average when the 2011 earthquake struck. (Fukuma et al. 2017)

Strategies to Increase Capacity

Workforce - COVID-19 Surge Capacity

- Medical & nursing students incorporated early
- Retired healthcare workers returned
- Part-time staff to full-time staff
- Recruitment drives
- Elective procedures delayed

Physical Infrastructure - COVID-19 Surge Capacity

- Surgical operating rooms converted to ICU units
- Anaesthesia machines converted into ventilators
- Ventilators were used for more than one patient.
- Ambulatory clinic spaces converted to inpatient wards

Metrics and Indicators - Workforce

Motivated and Supported Workforce / Well-being of Staff

COVID-19

- Anxiety and panic about PPE shortages (particularly students)
- High absenteeism in the early days - fears about their personal and family's safety
- Lack of knowledge and concerns about decision making

Economic Crisis

- Portugal: Professional demotivation: wage reductions, career freeze, contractual instability, and intensification of the work pace
- Spain: Worsening conditions and associated anger
Anxiety about lower quality of care for patients

Example study: Standardized Questionnaire

Warwick-Edinburgh Mental Well-Being Scale
COVID-19 Quarantine Centre in Qatar

17.4% of all participants had suboptimal well-being, which represented better coping than the study had anticipated (Wadoo, 2020)

Supports for Staff COVID-19

- Childminding
- Flexibility for Workers
- Training Supports
- Psychological support
- 'Support lines' set up for healthcare workers

Metrics and Indicators – Service Delivery (n=42)

Impact on Normal Services

Baseline comparison COVID-19 Studies

- Weeks before shock in early 2020
- Comparative period - (April 2020 vs April 2019)
- Aggregate of Years before shock (average of April 2018 and April 2019, versus 2020)

Number of people attending services

- Emergency department
 - Number of admissions
 - Referrals from other services.

Activity

- Testing numbers
- Procedures
- Changes in Diagnoses numbers
- Investigations
- Treatment

Quality of Care

- Time to treatment for non-COVID-19 admissions in emergency departments
- Health outcomes, such as survival rates

Metrics and Indicators – Governance (n = 34)

Information Systems

Effective information systems and flows are critical to any effective response to a disaster

COVID-19 studies - real time picture of how new information systems and surveillance can be set up (**NB** - timely, up to date, relevant)

Study Example: Study on the strengths and weaknesses of the U.S. Public Health Surveillance Systems during the H1N1 2009. Imperfect Nature of the metrics - Surveillance data are the result of a series of decisions made by patients, health care providers, and public health professionals (Stoto et al. 2012)

Leadership / Transparency / Decision Making

- Lack of transparency
- Lack of medical workforce involvement in decision making

Coordination across partners / Capacity

- Need for coordinated action, effective collaboration across sectors
- High communication

Study Example: Tsunami threat in California: A large network of organizations contributed to response activities, with emergency management & EMS, law enforcement, fire, public health, public works, and media (Hunter et al. 2012)

Metrics and Indicators – Finance (n = 26)

Absolute measures

- Health expenditure as proportion of GDP
- Public Health Expenditure (total and %)
- Private Health expenditure (total and %)
- Out of pocket payments (total and %)
- Salaries (health professionals)
- Financial stability
- Insurance cover
- Pharmaceuticals
- Direct costs of shock
- Population impact e.g. unemployment

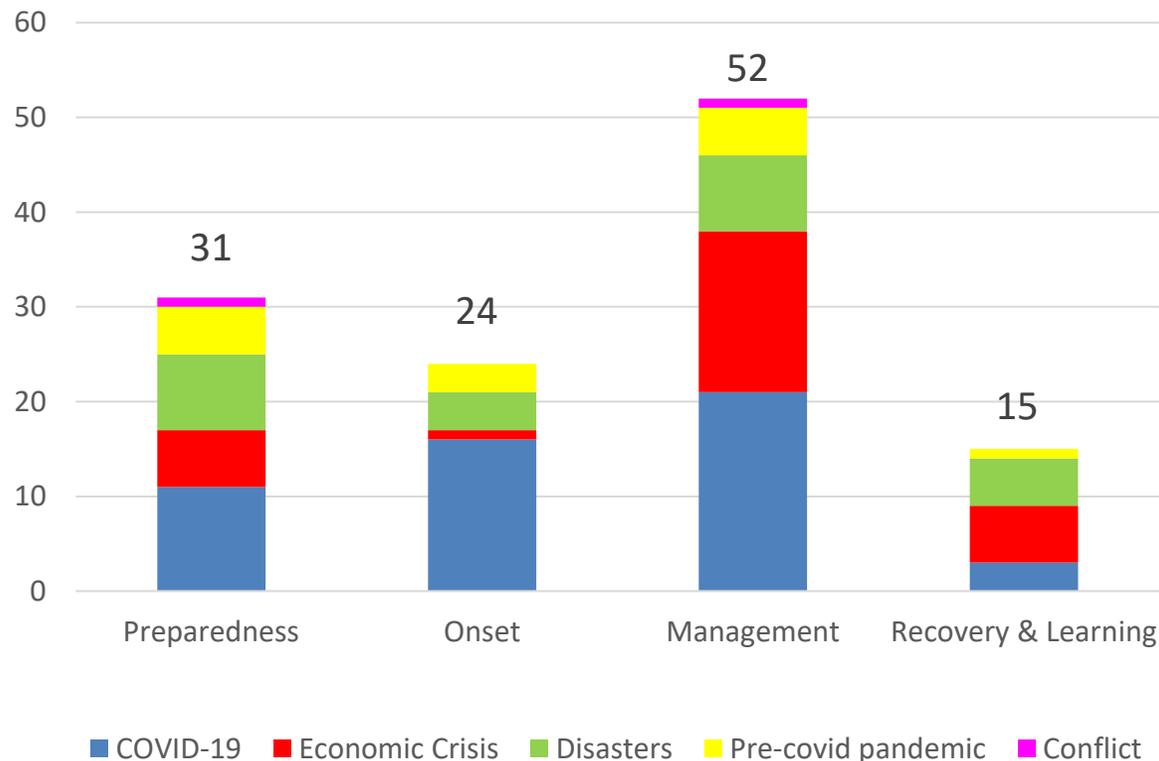
Funding

- Total funding over time
- By type (hospital, primary care, dental, labs etc)
- Investments
- Additional funding (mental health)
- Telehealth

Impact of shock

- Loss or limitation of coverage / entitlement (e.g. residents)
- Reduced Access
- Unmet need
- Longer Waiting lists
- Perceptions of stakeholders
- Protection of funding for disadvantaged

Shock Cycle



Stage 1: Preparedness

COVID-19 Studies: Many used composite measures which were then correlated with COVID-19 outcomes such as confirmed case numbers or total deaths.

- Counterintuitively in some studies, countries with greater preparedness scores had worse COVID-19 outcomes.
- Why? Better detection capabilities, industrial; countries had better conditions for transmission? (Ding et al)

Stage 2: Onset – Critical study focus for pandemics

Stage 4: Recovery, Legacy and learning

Few studies looked at the long-lasting effects of shocks – changing care patterns, impact on workforce

Reflections

Broad review of health system resilience across different shock types though COVID dominating recent research

Key insights into strategies

- Surge capacity and motivation of workforce
- Effective information systems
- Shared and transparent decision-making
- Preserving normal service delivery and protecting access

Preparedness is no guarantee of success and legacy of shocks is neglected.



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Thank you