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Preparing for evidence synthesis in public health

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Conflict of interest

This presentation draws on research and thinking developed as part of several past or ongoing collaborative methodological research projects, often concerned with „complex interventions in complex systems“:

- COVID-19 evidence ecosystem (CEOsys)
- WHO project on retrieval, synthesis and assessment of evidence on complex health interventions
- Integrated health technology assessment for the evaluation of complex technologies (INTEGRATE-HTA)

The views presented are those of the authors and do not necessarily represent those of the above collaborative efforts.

Other than that, I have no conflict of interest in relation to this presentation.

Setting the scene

Characteristics of public health interventions

- Population-level interventions
- Broad range of intervention goals: primary/secondary/tertiary prevention, health promotion, health protection, ...
- Very heterogeneous interventions: behavioural, environmental, policy, health system, ...
- Broad range of intended and unintended, health and non-health outcomes
- High level of dependency on context and implementation

Public health interventions in this presentation



Nine tentative recommendations

1. Place your review in the wider decision-making context.

Why?

- Enhance utility and uptake of evidence
- Embed review question in “bigger picture”
- Be forward looking and anticipate changes

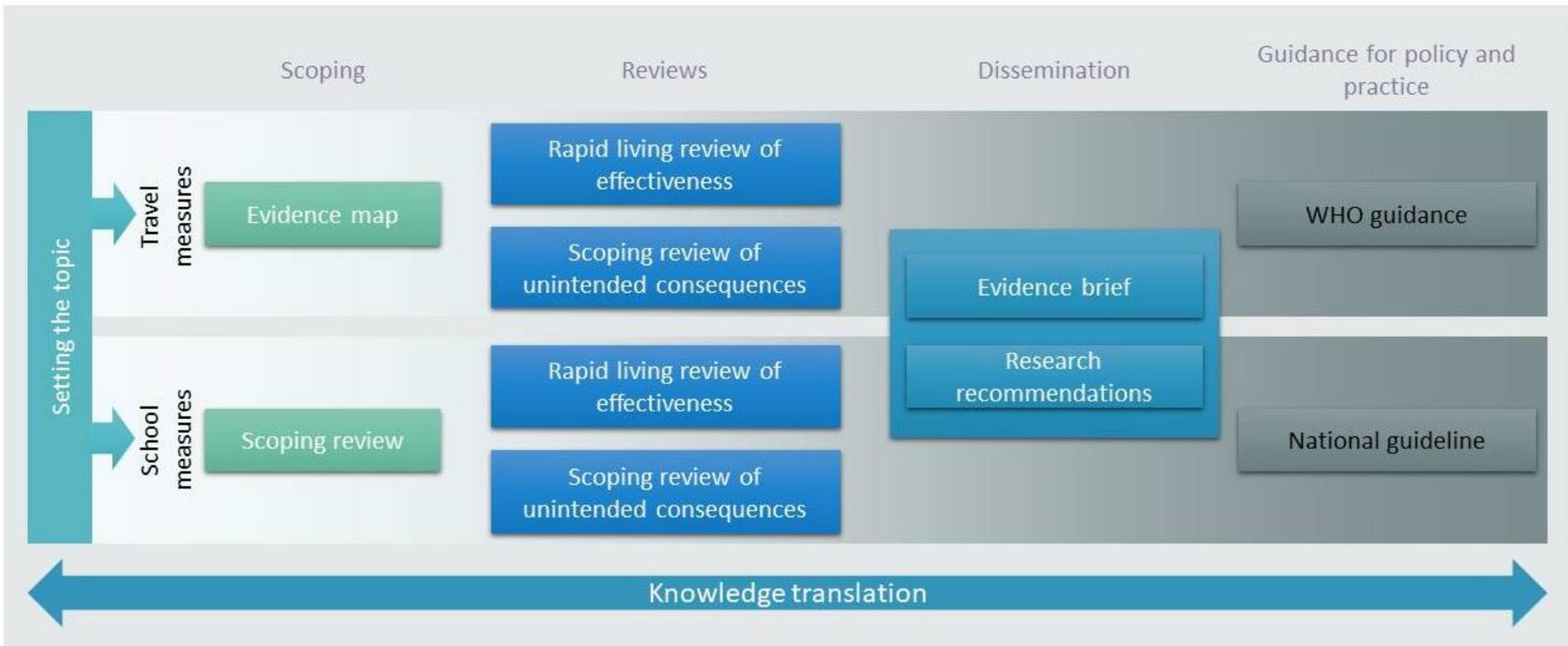
How?

- Stakeholder consultation and (ongoing) knowledge translation
- Multi-component evidence package
- (Adaptable) living review

1. Place your review in the wider decision-making context.



Public Health approach



2. Consider undertaking a **scoping review** and/or other ways of **formal scoping**.

Why?

- Obtain overview of the availability, nature and sources of evidence
- Inform scope, eligibility criteria and search strategies of subsequent reviews that are informative and feasible

How?

- Scoping review methodology

2. Consider undertaking a **scoping review** and/or other ways of **formal scoping**.

Example: Travel measures during COVID-19

- Intervention: only cross-border travel measures (review scope)
- Outcomes: primarily infectious disease control-related
- Study design: primarily modeling studies



Open access

Original research

BMJ Open Travel-related control measures to contain the COVID-19 pandemic: an evidence map

Ani Movsisyan ^{1,2} Jacob Burns ^{1,2} Renke Biallas,^{1,2} Michaela Coenen,^{1,2} Karin Geffert,^{1,2} Olaf Horstick,³ Irma Klerings,⁴ Lisa Maria Pfadenhauer ^{1,2}, Peter von Philipsborn ^{1,2}, Kerstin Sell,^{1,2} Brigitte Strahwald,^{1,2} Jan M Stratil,^{1,2} Stephan Voss,^{1,2} Eva Rehfuess^{1,2}

3. Make use of the potential of **stakeholder engagement**.

Why?

- Prioritise question(s) and define scope
- Ensure that review is policy-relevant

How?

- Involve content experts
- Engage with potential end-users
- One-off vs. ongoing involvement

3. Make use of the potential of **stakeholder engagement**.

Example: Environmental interventions on soft drink consumption

- Review Advisory Group reviewed protocol and full review
- Sugar-sweetened milk: separate intervention category; total milk intake as potential adverse outcome



Cochrane Database of Systematic Reviews

Environmental interventions to reduce the consumption of sugar-sweetened beverages and their effects on health (Review)

von Philipsborn P, Stratil JM, Burns J, Busert LK, Pfadenhauer LM, Polus S, Holzapfel C, Hauner H, Rehfuss E

4. Compose your team to ensure **methodological and content expertise** as well as **sufficient manpower**.

Why?

- Ensure that review is scientifically rigorous and “in touch” with work in research field
- Make sure that review is feasible to conduct within given timeframe

How?

- Identify required expertise during scoping and protocol development
- Recruit team members and train novices “on the job”

4. Compose your team to ensure **methodological and content expertise** as well as **sufficient manpower**.

Example: Travel measures during COVID-19

- Methods expertise: four modellers, focus on critical appraisal
- Manpower: shadowing, contributing, leading on tasks



**Cochrane
Library**

Cochrane Database of Systematic Reviews

International travel-related control measures to contain the COVID-19 pandemic: a rapid review (Review)

Burns J, Movsisyan A, Stratil JM, Biallas RL, Coenen M, Emmert-Fees KMF, Geffert K, Hoffmann S, Horstick O, Laxy M, Klinger C, Kratzer S, Litwin T, Norris S, Pfadenhauer LM, von Philipsborn P, Sell K, Stadelmaier J, Verboom B, Voss S, Wabnitz K, Rehfues E

5. Develop a **logic model** that accommodates a systems perspective.

Why?

- Consider interventions within broader system
- Capture context and implementation issues
- Think through possible causal pathways

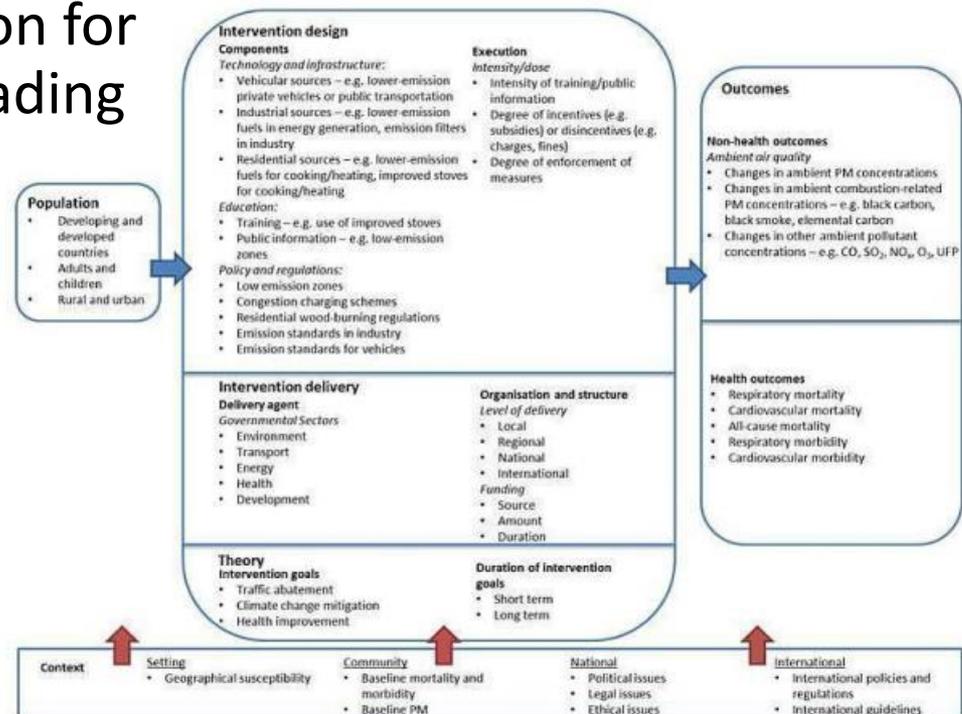
How?

- Literature-based conceptual models
- Logic model templates and CICI framework

5. Develop a **logic model** that accommodates a systems perspective.

Example: Ambient air pollution interventions

- Context and implementation aspects for data extraction and assessment of heterogeneity
- Interventions categorisation for evidence synthesis and grading



6. Conceptualise **unintended consequences** from a societal perspective.

Why?

- Facilitate assessment of the balance between benefits and harms of an intervention from a societal perspective

How?

- WHO-INTEGRATE framework
- Dark logic models and other tools to focus on adverse consequences
- Separate review with searches conducted in health and non-health databases

6. Conceptualise **unintended consequences** from a societal perspective.

Example: School measures during COVID-19

- Scoping review on unintended consequences (in progress)
- German guidelines on school measures during COVID-19



Rationale for the recommendation according to the WHO-INTEGRATE criteria							
	against ----- for measure measure				varies	unclear	
Balance of health benefits and harms				×			
Human rights				×			
Socio-cultural acceptability					×		
Health equity, equality, non-discrimination		×					
Social and ecological implications		×					
Financial and economic considerations						×	
Feasibility and health system considerations				×			

7. Define and categorise PICO elements with a view to evidence synthesis.

Why?

- Enable informative and efficient data extraction
- Prepare for meaningful evidence synthesis

How?

- Literature-based classification system (with adaptation)
- Theoretical or causal pathway-informed categorisation

7. Define and categorise PICO elements with a view to evidence synthesis.

Example: School measures during COVID-19

- Logic model in scoping review and rapid review



Measures to reduce transmission of SARS-CoV-2

Measures reducing the opportunity for contacts

- Measures reducing the number of students and contacts
- Measures reducing the number of contacts

Measures making contacts safer

- Masks
- Cleaning
- Handwashing
- Modification of activities
- Ventilation
- Multicomponent measures

Surveillance and response measures

- Mass testing and isolation measures
- Symptom-based screening and quarantine measures

Multi-component measures

8. Carefully consider eligible **study designs** and decide on methods to appraise and synthesise these.

Why?

- Inform appropriate methods during all stages of review
- Where applicable, address challenges of different types of non-randomised study designs
- Where applicable, address challenges of modelling studies

How?

- Formal scoping regarding availability and nature of evidence
- Consultations with policy stakeholders and methodologists

8. Carefully consider eligible **study designs** and decide on methods to appraise and synthesise these.

Example: Travel measures during COVID-19

- Randomised and high-quality observational evidence unlikely
- Almost exclusive reliance on modelling studies
 - Unclear distinction between more/less informative modelling studies
 - Bespoke tool to appraise modelling studies
 - Multiplicity of scenarios (interventions, co-interventions, context) in evidence synthesis
- Reflective points on modelling studies:
 - Garbage in, garbage out?
 - Does aggregation always increase power?



9. Decide on a relevant **threshold for grading** the evidence.

Why?

- Prepare for a meaningful interpretation of review findings
- Ensure that domains for grading certainty of evidence down or up are appropriately applied

How?

- Difference from the null usually a good starting point in systematic reviews (and guidelines)

9. Decide on a relevant **threshold** for grading the evidence.

Example: School measures during COVID-19

- Difference from the null considered most relevant threshold across multiple outcomes
- Direction of effect: positive/negative in narrative synthesis
- Inconsistency: no downgrading if most studies showed consistently positive or negative effects
- Imprecision: downgrading if studies showed variation in magnitude of effect across the null



Conclusion

Nine tentative recommendations

1. Place your review in the **wider decision-making context**.
2. Consider undertaking a **scoping review** and/or other ways of **formal scoping**.
3. Make use of the potential of **stakeholder engagement**.
4. Compose your team to ensure **methodological and content expertise** as well as **sufficient manpower**.
5. Develop a **logic model** that accommodates a systems perspective and captures context and implementation issues.
6. Conceptualise **unintended consequences** from a societal perspective.
7. Define and **categorise PICO elements** with a view to evidence synthesis.
8. Carefully consider eligible **study designs** and decide on methods to appraise and synthesise these.
9. Decide on a relevant **threshold for grading** the evidence.

Thank you

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