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## Novel methods for health intervention research

Research is important for the ideation, design, and testing of health interventions. Intervention research can be classified into four dimensions:

1. Identification of health intervention needs, which requires large-scale population-representative studies (e.g. [1–3]).
2. Design research to create interventions that are desirable, feasible and viable, which requires ethnographic studies, ideation, and prototype and pilot testing (e.g. [4–7]).
3. Evaluation research to quantify (i) causal effects and impacts – causal impact evaluation – [8–10], (ii) mechanisms of action – performance or process evaluation – [11], and (iii) social value of health interventions – economic evaluation [12].
4. Governance and policy translation research to guarantee the ethical and political ‘goodness’ of our approaches to real-life health intervention research [13, 14] and to ensure rapid incorporation of novel insights into health policy and routine practice [15].

For each of these four dimensions of health intervention research, I present several novel methodological approaches and illustrate them with examples from real-life studies in resource-poor communities in Africa and Asia. My focus is on innovative study designs: new forms of design research for health interventions [16], a range of innovative experimental and quasi-experimental approaches for causal impact evaluation [17–21], new methods to validly measure

health and behavioral outcomes [22–24], novel approaches to quantify economic evaluation [25], and new methods for policy and public engagement. For each method, I explain the intuition, describe epistemic and statistical backgrounds, and discuss application opportunities, strengths and weaknesses.

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