

# Quasi-experimental study designs series—paper 13: realizing the full potential of quasi-experiments for health research

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## Abstract

Although the number of quasi-experiments conducted by health researchers has increased in recent years, there clearly remains unrealized potential for using these methods for causal evaluation of health policies and programs globally. This article proposes five prescriptions for capturing the full value of quasi-experiments for health research. First, new funding opportunities targeting proposals that use quasi-experimental methods should be made available to a broad pool of health researchers. Second, administrative data from health programs, often amenable to quasi-experimental analysis, should be made more accessible to researchers. Third, training in quasi-experimental methods should be integrated into existing health science graduate programs to increase global capacity to use these methods. Fourth, clear guidelines for primary research and synthesis of evidence from quasi-experiments should be developed. Fifth, strategic investments should be made to continue to develop new innovations in quasi-experimental methodologies. Tremendous opportunities exist to expand the use of quasi-experimental methods to increase our understanding of which health programs and policies work and which do not. Health researchers should continue to expand their commitment to rigorous causal evaluation with quasi-experimental methods, and international institutions should increase their support for these efforts. © 2017 Elsevier Inc. All rights reserved.

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## 1. Introduction

Articles in this themed issue of the Journal of Clinical Epidemiology describe several theoretical and practical arguments for placing a higher value on quasi-experiments for the causal evaluation of health policies and programs [1,2]. However, coordinated efforts will be necessary for the field of health research to realize the full potential of these methods. Encouragingly, there is positive momentum to build on, as commitments to rigorously evaluate social programs appear to be increasing globally. Indeed, a recent review found that published studies that use experimental or quasi-experimental methods to evaluate the impacts of health policy and practice interventions in low- and

middle-income countries have dramatically increased in number in recent years, from 31 in 2002 to 233 in 2012 [3]. This trend mirrors similar trends in other international development research sectors, including education and agriculture. Quasi-experiments account for around one-third of rigorous (i.e., experimental or quasi-experimental) causal impact evaluations published across all international development sectors in the past decade. There is similar evidence of an increased use of quasi-experimental methods, particularly instrumental variable and regression discontinuity designs, to evaluate the impact of health interventions in developed countries [4,5].

The recent increase in the production of quasi-experimental causal evaluations is likely attributable to several factors. First, financial support for rigorous evaluation has grown, with several funding mechanisms established in recent years, including the US Government's Social Innovation Fund [6], the International Initiative for Impact Evaluation (3ie) [7], and the World Bank's Strategic

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**What is new?**

- This article proposes five prescriptions for capturing the full value of quasi-experiments for health research. These prescriptions are derived from the full set of articles included in this themed issue of the Journal of Clinical Epidemiology.
- These prescriptions are as follows:
  1. New funding opportunities should be developed for quasi-experimental studies.
  2. Administrative data from health programs should be made more accessible to researchers.
  3. Quasi-experimental method courses should be integrated into health science graduate programs.
  4. Standard guidelines should be developed for primary research and synthesis of evidence from quasi-experiments.
  5. Investments should be made to develop new innovations in quasi-experimental methodologies.

Impact Evaluation Fund [8]. Traditional development program funders like the United States Agency for International Development (USAID) have also increased resources for conducting evaluations alongside implementation activities [9]. Second, data amenable to quasi-experimental analysis are increasingly being collected and made available. For example, systems for collecting longitudinal administrative data to monitor public programs have increased [10]. Third, methodological advances have expanded the universe of potential quasi-experiments. For example, randomized encouragement studies—a quasi-experimental design in which participants are randomly invited to receive an intervention but decide for themselves whether to take up the intervention—are being used more and more when pure randomization is not possible [11].

Despite these developments, health researchers are clearly trailing their colleagues from other research sectors in adopting quasi-experimental methods. Only 17% of rigorous (i.e., experimental or quasi-experimental) health evaluations published in recent years used quasi-experimental designs, whereas 65% of rigorous evaluations across education, agriculture, and social protection sectors used these designs [3]. One reason for this discrepancy may be historical, as many of the institutions that facilitate health research focus strongly on clinical effectiveness by the use of randomized controlled trials. Indeed, the Cochrane Collaboration, the primary facilitator of systematic reviews in the health sector, has relatively recently started to recommend consideration of nonrandomized studies for inclusion in reviews [12]. Similar institutions in other research sectors, for example, the Campbell Collaboration,

have long recommended the inclusion of quasi-experiments in reviews [13,14].

The relative acceleration of the adoption of quasi-experimental methods in other sectors is evidence of the unrealized potential of these methods for health researchers. In this paper, we build on the articles in this themed issue [1,2,15–22] and propose five prescriptions for capturing the full value of quasi-experiments for health research.

## 2. Realizing the full potential of quasi-experiments

### 2.1. Prescription 1: expand funding

Although the costs of conducting quasi-experimental studies are usually lower than for experiments, funding is still required. Resources to conduct quasi-experiments in the health sector appear to have grown in recent years, but insufficient funding remains a constraint. In 2010, USAID funded and published one quasi-experimental evaluation of a health project, and in 2015, they funded and published five such evaluations [23]. Of the 48 total health evaluations USAID published in 2015, most used observational or qualitative methods. The World Bank has been ahead of most other funders in their support of quasi-experimental evaluations, though many of the projects that they fund are carried out internally [24]. Expanding funding opportunities for a broad pool of health researchers would almost certainly increase the production and publication of high-quality quasi-experimental evaluations.

The common practice of bundling resources for experimental and quasi-experimental proposals under a single funding call, as is frequently done by the US National Institutes of Health (NIH), may hinder the expansion of quasi-experimental methods. When considered in isolation, an experimental proposal will likely receive a higher reviewer score, and thus be more likely to be funded, than a quasi-experimental proposal; a key advantage of quasi-experiments is that they allow for research questions that are not amenable to experimental designs [1]. That is to say, for certain important health research questions, quasi-experimental methods may provide a better “fit for purpose” [25,26], and funding opportunities specifically targeted at quasi-experiments might open up exciting new avenues of inquiry. They would also allow funding agencies to target reviewers with the skills to adequately assess and compare proposals that use quasi-experimental methods.

### 2.2. Prescription 2: expand access to administrative data

The recent proliferation of information technologies around the globe has dramatically increased the amount of administrative data being collected for health programs. Most countries now have a public health information system to track programs to inform management, planning,

and monitoring activities [27]. New mHealth systems are also contributing potentially powerful data [28]. However, the mere existence of these data is of limited value on its own, and substantial coordinated efforts are required to analyze and interpret the information being collected in a meaningful way [29]. In some instances, administrative data may provide a powerful means to evaluate the causal impact of health programs using quasi-experimental methods. For example, longitudinal data collected before and after the implementation of a new program can allow for difference-in-differences or interrupted time series analyses.

However, most administrative data collected by governments or nongovernmental organizations are not available to researchers. Efforts should be undertaken to expand public access to data collected from health programs and to encourage the use of these data for rigorous causal evaluations. These efforts must be sensitive to the potential vulnerabilities of those willing to provide data and cognizant of data protection and information privacy issues. They must also recognize that technical support may be necessary to improve the quality and usefulness of these data [30]. Several countries have already begun to implement public sector open data initiatives or have established mechanisms for access to health registries, which may serve as models for future efforts [31].

### 2.3. Prescription 3: strengthen researcher competencies

Most graduate students in health science programs do not learn quasi-experimental methodologies, and as a result, many health researchers do not have strong skills in causal impact evaluation of programs and policies using these methods. This serves to constrain both the production of new quasi-experimental evaluations and the meaningful interpretation and synthesis of existing evaluations. Most health researchers who have skills in using quasi-experimental methods for evaluation studies have received some training in psychology or econometrics, which have a strong tradition of developing and using the methods [32,33].

To realize the full potential of quasi-experiments, it will be necessary to dramatically increase the number of health researchers with competency to use these methods for evaluation. In this issue, Rockers et al. [21] make the point that strengthening competencies is also fundamental to efforts to successfully incorporate quasi-experiments into systematic reviews of health research. One way to achieve this is to incorporate existing courses in econometrics or program evaluation into health sciences PhD curriculums, as is already happening at some universities. Additionally, new training programs focused specifically in evaluation methods should be developed and offered to midcareer professionals working in the health field. Finally, online courses in quasi-experimental methods should be developed for professionals who are not able to attend programs

at universities. Although a few courses currently exist that expose students to the basics of rigorous impact evaluation [34], options for developing methodological skills are lacking.

### 2.4. Prescription 4: develop reporting and synthesis guidelines

There is a strong tradition in the field of health research of reporting guidelines for rigorous description of studies, as collected by the EQUATOR network [35]. Guidelines for reporting quasi-experiments do not currently exist, and several articles in this issue focus on their development, a fundamental step in realizing the full potential of the methods. Guidelines will improve the quality and transparency of primary studies and expand the universe of systematic reviews, a primary vehicle through which public health practitioners and policymakers are exposed to evidence.

In this issue, Reeves et al. [20] and Waddington et al. [22] have developed a taxonomy for describing and understanding quasi-experiments. They have also started the difficult work of applying that taxonomy toward a risk of bias framework, which is necessary for delineating good quality studies from poor quality studies. Also in this issue, Bärnighausen et al. [16] clarify the assumptions that underlie the basic quasi-experimental designs. Future work should focus on finalizing an agreed upon taxonomy and a clear set of signaling questions for determining study quality which can be integrated into a framework like GRADE. Aloe et al. [15], Becker et al. [17], and Glanville et al. [18] fill in the details for operationalizing research synthesis from quasi-experimental studies. These efforts should be developed further to create a useful guidebook for researchers. Finally, Lavis et al. [19] discuss key issues around knowledge translation. It will be important for policymakers to become familiar with quasi-experimental designs if they are to use the evidence from these studies effectively.

### 2.5. Prescription 5: foster methodological innovation

Methodological innovation can quickly and dramatically increase the value of quasi-experiments for the causal evaluation of health programs and policies. The sheer volume of data currently being collected on health programs, which will only continue to grow in the future, offers tremendous potential for understanding which programs work and why. However, proper methods are needed to fully exploit the potential of these data [36,37]. The big data revolution has to this point been focused largely on data mining and establishing correlation patterns. However, there is great potential for developing new rigorous quasi-experimental methods to increase the value of these data.

One interesting recent innovation in quasi-experimental methodology made possible by advances in genomic data collection and processing is Mendelian randomization, a

form of instrumental variable analysis resulting from the random assortment of genes that occurs during conception, which has opened up exciting new possibilities for exploring the causes of and effective treatments for important diseases [38]. It is difficult to say exactly where the next innovation might develop and what is needed is a coordinated effort to invest in several potential avenues of innovation concurrently, understanding that most will yield nothing. Innovations that improve the feasibility of evaluating complex health intervention may prove particularly valuable for the field of health research [39]. Also, valuable will be innovations in computing technologies that improve the usability of intensive analytic methods.

### 3. Conclusions

Health researchers have not taken full advantage of quasi-experimental methods for causal impact evaluation of policies and programs. As a result, resources are likely being wasted on ineffective programs, and effective programs are not being scaled-up as they should be. There is clearly an expanding commitment to rigorous causal evaluation in the health sector, and leading institutions in the field should initiate stronger efforts to expand the production of quasi-experimental studies.

What is needed is a concerted effort by several institutions working in parallel. Health sector funders, including USAID, NIH, the European Commission, the Bill and Melinda Gates Foundation, and the Wellcome Trust, should expand resources devoted specifically to quasi-experimental evaluations. Governments and health program implementers should commit to making the administrative data that they are already collecting publically available or accessible to researchers upon request. Traditional academic institutions and education innovators should increase opportunities to learn quasi-experimental methods. Researchers and evidence synthesis organizations should develop guidelines to standardize the use of quasi-experimental methods both for reporting of primary studies and for secondary research like systematic reviews. Finally, funders and academic institutions should take steps to foster innovation in the development and application of quasi-experimental approaches. Health researchers have a responsibility to do more with the quasi-experimental methods available to them, and better institutions are needed to facilitate such efforts.

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