

Public Health Triangulation to inform decision-making in Belgium

N. BOSSUYT^a, V. VAN CASTEREN^a, G. GODERIS^b, J. WENS^c
S. MOREELS^a, VANTHOMME K^a, E. DE CLERCQ^d

^aScientific Institute of Public Health (IPH), Operational Directorate Public Health and Surveillance, Brussels, Belgium

^bAcademisch Centrum voor Huisartsgeneeskunde, KU Leuven, Belgium

^cCentrum voor Huisartsgeneeskunde, Universiteit Antwerpen, Belgium

^dResearch Institute for Health and Society (IRSS), UCL, Belgium

Abstract. We assessed the impact of a nation-wide ambulatory care complex intervention (the “care trajectory program”) on quality of care in Belgium. We used the three-step public health triangulation method described in this paper and data from four different data sources: a national reimbursement database, an electronic patient record-based general practitioner network, the Belgian general practitioner sentinel network, and a new national registry for care trajectory patients. By applying our method and using the available evidence, we identified key findings that have been accepted by experts and stakeholders. We also produced timely recommendations for the decision-making process, four years after the start of the care trajectory program.

Keywords: Ambulatory Care, Methods, Quality of Health Care

Introduction

Since 2009, the National Institute for Health and Disability Insurance (NIHDI) in Belgium has funded a complex intervention in ambulatory care to organise and coordinate the treatment and follow-up of patients with Type 2 diabetes mellitus (DM-2) and patients with chronic renal failure (CRF). This intervention, the so called “care trajectory” program (CT) was initially funded for a period of five years. By the end of 2012, around 52 000 patients had already been enrolled in the CT. The NIHDI simultaneously set up the ACHIL (Ambulatory Care Health Information Laboratory) project in order to assess the impact of the CT on quality of care and inform the decision on whether or not to continue funding the CT.

The ACHIL project was allowed to use data from four different data sources: the existing registries 1) IMA (the national reimbursement claims database including all Belgian citizens) and 2) Intego (a regional EPR-based network of a sample of GPs) that allow for retrospective data analysis, 3) a paper-based, ad hoc data collection using the existing Belgian GP sentinel network (SGP) and 4) a new national primary care EPR-based registry for care trajectory patients [1, 2]. Each of the data sources had limitations in assessing the impact of the CT on quality of care (such as no clinical/diagnosis information, a limited number of GPs or parameters).

Public health decision-making processes often lack high quality data and studies such as randomised controlled trials (RCTs). The challenges faced when using routinely-collected primary care data and healthcare utilisation databases have been extensively documented [4, 5]. Public Health Triangulation (PHT) has been shown to be useful for synthesising multiple different data sources, enabling trends to be observed and the impact of interventions to be determined, and thereby informing public health decision-making. PHT was defined by Rutherford et al as “*the process of reviewing and interpreting existing data sources that bear on different facets of a broad public health question in order to identify factors that underlie the observed data and to assist with public health decision-making and actions*” [3]. In this paper, we report on the Belgian national public health triangulation method as applied to imperfect databases to assess the impact of the care trajectory programme on quality of care and to inform decision-making.

1. Methods

The multi-disciplinary research project consists of six researchers from three research centres, a stakeholder and an expert group (including GPs, diabetologists and nephrologists). The method used involves three major steps (see Figure 1).

In the first step the research team builds a common understanding of the broad research question, defines clear, shared objectives, and identifies the added value of each data source. The team identifies the main common analytical levels and defines common specific research topics using the existing literature, reports, or guidelines. Only research topics for which at least one database (and preferably two or more) can provide valid parameters are selected. The results of this step are submitted to the expert and stakeholder groups.

Next, for each database the research topics are translated into specific research questions taking into account its specific features, such as the available data collection periods or the definitions of specific patient groups. With the aim to provide the most valid answers to the research topics, detailed analysis plans are produced for each database and, when required, submitted to the Privacy Protection Commission. To increase the level of privacy protection, data from any one database is only accessible to the researcher performing all of the analyses for that database. However, the protocols, methods, and results are discussed in detail by the whole research team.

Then, based on the common research topics and using the results from each database, a common technical report is produced. Using qualitative synthesis methods, common trends and shared observations are identified. First, common trends between the same parameters within several databases are identified. Next, using the common research framework, the various parameters and research topics are grouped together in order to identify global trends or observations. Only the principal findings that are compatible with all of the data sources and supported by at least one (and preferably two) data sources are selected. This technical report is then discussed with the experts and refined and a pre-final report, based on the main findings (global trends and observations) and supported by the most relevant data, is produced and discussed with the stakeholders. The final report is edited to inform the decision-making process.

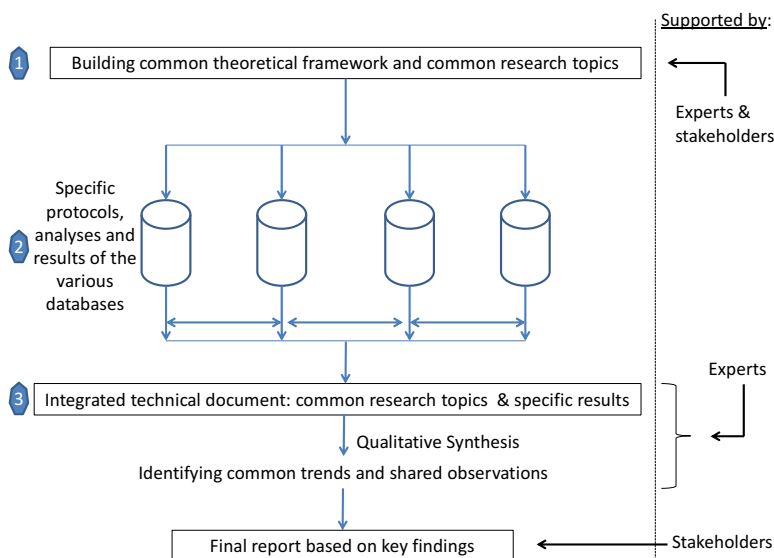


Figure 1. Belgian Public Health Triangulation methods.

2. Results

In consultation with the stakeholders, the focus was narrowed to the assessment of the quality of “technical” care, i.e. how well care conforms to well-accepted national or international guidelines in terms of care processes and health outcome. Effectiveness rather than efficiency of the care intervention was measured. Three levels of effectiveness analysis were identified: 1) crude effectiveness (i.e. “What percentage of care trajectory patients met a target value for a defined parameter at a given point in time?”), 2) comparative effectiveness over time (i.e. “Did the achievement of a defined target evolve over time in the years preceding and following the start of the care intervention?”), and 3) comparative effectiveness over patient groups (i.e. “Was the evolution of the achievement of a defined target over time different among care trajectory patients when compared with patient groups not enrolled in the program?”).

Quality-related parameters, such as HbA1c, physical activity or statin use, were selected based on the available evidence, provided that data was available in at least one research database and that a target could be identified for CT patients. For each parameter, a target was formulated, allowing either a positive or a negative value to be allocated to each change associated with the care intervention. Parameters were next grouped into 43 research topics, (of which 32 were being supported by at least two data sources) that could be grouped into five main research domains. This common theoretical framework was submitted to the expert group.

Secondly, for each database we produced a detailed technical report with analysis plans and performed quantitative analyses.

The third step involved producing a common technical research report for each care trajectory. Based on the common reports and the theoretical framework, key findings were identified by comparing CT patient profiles and by comparing parameters and research topic trends, taking into account research topics domains, type

of parameter (outcome/processes), study design (cross-sectional/cohort study), and type of analysis (crude/comparative effectiveness). Discussing these reports and key findings with the expert group led to substantial improvements: withdrawal of parameters, adaptation of targets, addition of analyses and rephrasing of key findings. Thus 35 common research topics were retained (of which 20 supported by at least two databases) and five key findings (of which four supported by at least two databases) were identified: 1) many patients targeted by the program were enrolled in a care trajectory by 2011; 2) many patients included in a care trajectory already required more intensive care before the start of the program; 3) prior to their enrolment, many patients already had a more intensive, if not always optimal, follow up; 4) patient follow up significantly increased and improved after enrolment and 5) the current data do not provide enough evidence to support an improvement of the clinical outcome. The first finding (relying on one data source and not fully supported by the stakeholders) was partially withdrawn from the final report. The final report influenced the decision by the NIHDI to continue funding the care trajectory program.

3. Discussion and conclusions

Triangulation has been widely used to increase the ability of researchers to interpret findings since it was neither possible to match the various databases at the individual patient level nor to perform a meta-analysis, as the databases were too different [3, 6]. Our public health triangulation method was in line with the five guiding principles of public health triangulation, as described by Rutherford et al. [3]: 1) use of existing data, 2) qualitative synthesis, 3) inclusion of diverse dissimilar data sources, 4) input from stakeholders, and 5) informing public health decision-making. Our method was effective at using the available evidence to produce generally accepted findings and timely recommendations for decision-making concerning the continuation of the CT national intervention.

Data and methods were triangulated to provide a more complete overview of the effectiveness of the CT program. Adding process to outcome parameters, providing data for all patients engaged in the CT program, and providing specific information such as reasons for non-inclusion in the program yielded new insights. The most relevant database-specific study protocols allowed to take into account their specific constraints. Discussing all protocols and results in depth by the entire team optimised analysis and reduced researcher bias. The involvement of experts from various disciplines improved clinical relevance and scientific soundness of the results. Formulating findings iteratively within research team, with expert and stakeholder group, may improve the reproducibility of the results.

Building a common theoretical framework provided a strong added value for supporting data confidentiality and ethical use of data, a clear common understanding of objectives and strategies, discussions and analysis within the research team, identifying key findings, and analysing vast amounts of data.

A major disadvantage of triangulation is the amount of time required [3, 6]. We spent a lot of time building a common and accepted theoretical framework, managing the project to keep most of the resources used within the scope of the theoretical framework, producing internal reports to support discussions within the ACHIL research team and with experts and stakeholders, and ensuring in-depth multidisciplinary discussions of all the dimensions and results of the project. At the end

of the analysis and expert validation processes, only 47% of the initial research topics were still supported by more than one database. This was partly due to missing data, poorly identified populations, the heavy workload for some GPs, and technical failures. This leads us to recommend a comprehensive (and time consuming) approach during the first step of the methodology.

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References

- [1] Van Casteren V, Moreels S, De Clercq E, Goderis G, Wens J, Vanthomme K, Bossuyt N. Do the national diabetes and chronic kidney disease care trajectories in Belgium improve the quality of care? Results from the ACHIL project. In: Scientific Institute of Public Health eds. Scientific Report 2012-2013. Brussels; 2014. [accessed at: www.wiv-isp.be/Publications/annual-reports]
- [2] De Clercq E, Van Casteren V, Bossuyt N, Goderis G, Moreels S. EPR-based, quality-related process parameters: a nationwide assessment. *Stud Health Technol Inform*. 2014; 205:121-5.
- [3] Rutherford G, McFarland W, Spindler H, White K, Patel S, Aberle-Grasse J, et al. Public health triangulation: approach and application to synthesizing data to understand national and local HIV epidemics. *BMC Public Health*. 2010; 10(447). Doi: 10.1186/1471-2458-10-447.
- [4] de Lusignan S, Van Weel C. The use of routinely collected computer data for research in primary care: Opportunities and challenges. *Fam Pract*. 2006; 23:253–63.
- [5] G Corrao. Towards the rational use of Healthcare Utilization Databases for generating real-world evidence: new challenges and proposals. *Epidemiology Biostatistics and Public Health*. 2014; 11(3).
- [6] Thurmond VA. The point of Triangulation. *J Nurs Scholarsh*. 2001;33(3):253-8