Prospective policy analysis—a critical interpretive synthesis review

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Abstract

Most policy analysis methods and approaches are applied retrospectively. As a result, there have been calls for more documentation of the political-economy factors central to health care reforms in real-time. We sought to highlight the methods and previous applications of prospective policy analysis (PPA) in the literature to document purposeful use of PPA and reflect on opportunities and drawbacks. We used a critical interpretive synthesis (CIS) approach as our initial scoping revealed that PPA is inconsistently defined in the literature. While we found several examples of PPA, all were researcher-led, most were published recently and few described mechanisms for engagement in the policy process. In addition, methods used were often summarily described and reported on relatively short prospective time horizons. Most of the studies stemmed from high-income countries and, across our sample, did not always clearly outline the rationale for a PPA and how this analysis was conceptualized. That only about one-fifth of the articles explicitly defined PPA underscores the fact that researchers and practitioners conducting PPA should better document their intent and reflect on key elements essential for PPA. Despite a wide recognition that policy processes are dynamic and ideally require multifaceted and longitudinal examination, the PPA approach is not currently frequently documented in the literature. However, the few articles reported in this paper might overestimate gaps in PPA applications. More likely, researchers are embedded in policy processes prospectively but do not necessarily write their articles from that perspective, and analyses led by non-academics might not make their way into the published literature. Future research should feature examples of testing and refining the proposed framework, as well as designing and reporting on PPA. Even when policy-maker engagement might not be feasible, real-time policy monitoring might have value in and of itself.

Keywords: Policy analysis, health systems research, critical interpretive synthesis

Key messages

- Though they are considered important, real-time, prospective health policy analyses are rarely documented as such in the literature.
- Intentional prospective analyses can inform rapidly-moving health policy processes.
- A synthesis framework is proposed as a heuristic to guide the design and reporting on prospective policy analyses.

Introduction

Policy analysis explains how different actors, concerns and ideas interacted with each other as the policy was developed (Walt et al., 2008), including ‘who made what policy decisions, when, why and how, and with what consequences’ (Gilson et al., 2018). Policy analysis can improve policy formulation, design and implementation (Walt et al., 2008). In health, where many policies (e.g. universal health coverage, soda taxes, abortion rights) are highly divisive across geographies, exhibiting the political nature of policy design and implementation, there have been calls for partnerships between researchers and political actors engaged directly in policy processes to provide more documentation of the political economy factors that are central to health-care reforms, especially in real-time, to facilitate ‘immediate lesson learning’ (Buse, 2008). However, policy analysis methods and approaches are often applied retrospectively (Walt et al., 2008). Information related to current policy processes and decision-making might be sensitive and confidential, with those engaged in the policy process not being at liberty to publicize them. Mechanisms for engagement between researchers and political actors depend on contextual factors and windows of opportunity, with their respective institutional barriers—such as policy actors needing information rapidly, researchers in academic settings not always being able to publish findings in an agile manner—creating barriers for using evidence from policy analyses as real-time learning. In 2008, Buse sought to generate debate and additional examples of prospective policy analysis (PPA) in health—‘analysis
which seeks to understand the unfolding political-economy environment of policy change so as to support stakeholders to more effectively engage in policy processes’ (Buse, 2008). Buse (2008) specifically advocates for PPA ‘in support of concurrent health policy-making and ‘undertaken by members of nationally based networks […] with pro-poor aims, collaboratively with analysis.’ In 2018, the World Health Organization Alliance for Health Policy and Systems Research’s Health Policy Analysis Reader drew further attention to PPA as ‘analysis IN and FOR the policy process: [encompassing] the use of analytical techniques, research, and advocacy in problem definition, decision-making, evaluation, and implementation’ (Gilson et al., 2018). However, despite the recognized importance of PPA (Buse, 2008; Gilson et al., 2018), the published literature appears scarce, and it is unclear whether and how researchers (e.g. academics who engage in policy analysis) and practitioners (e.g. policy analysts who are not based in academia) are sensitized to or trained in this type of analysis, potentially reinforcing the lack of attention it receives in the literature.

The COVID-19 pandemic is just one of the latest examples providing increased opportunities for researchers to bring evidence into decision-making, often embedded within policy institutions (Hale et al., 2021; Vickery et al., 2022; Pykett et al., 2023). The COVID-19 pandemic underscored the importance of immediate lesson-learning about how policies and programmatic solutions are implemented and how they evolve over time, which not only leads to better decision-making, but could save money and lives (Cairney, 2021). It is well established that evidence-informed decision-making and policy-making generally use multiple forms of evidence and perspectives (Cairney and Oliver, 2020; Vickery et al., 2022). Yet, large amounts of secondary data, including social and news media, are rarely systematically incorporated into published policy analyses, though the availability of real-time and publicly available data is improving (Schintler and Kulkarni, 2014; Höchtl et al., 2016). Additionally, researchers are increasingly focused on connecting directly with the policy process, including with policy actors or coalitions of advocates or through integrated knowledge translation, with related benefits and trade-offs (Cairney and Oliver, 2020; Jesusi et al., 2021). However, much remains to be learned about approaches such as integrated knowledge translation and whether and how they can stimulate improved use of evidence in the policy process (Gagliardi et al., 2017).

In this review, we sought to highlight the methods and previous applications of PPA in the literature to document its purposeful use, as well as to reflect on opportunities and drawbacks of PPA in the context of policy analysis. We conceptualized PPA as a type of policy ‘analysis which seeks to understand the unfolding political-economy environment of policy change to support stakeholders to more effectively engage in policy processes’ (Buse, 2008). We set out to discover the range of documented examples of PPA, how the authors of the study conceptualized it, the topics they used it for, and the methods and approaches they applied as part of the analysis. We did so with the broader goals of understanding the critical features of PPA, what sets it apart from other policy analysis approaches, and what strategies researchers and practitioners should consider when engaging in PPA. We used a critical interpretive synthesis (CIS) approach as our initial scoping revealed that PPA is poorly defined in the literature.

Materials and methods

Due to the exploratory nature of our study, a systematic review approach was not feasible or desirable. Nevertheless, we ensure that we provide sufficient details about our approach to ensure the reliability of our findings and replicability. The CIS review methodology is appropriate when an a priori definition of the issue or phenomenon of interest does not exist, or is tentative, fuzzy or contested (Greenhalgh et al., 2005). We used a CIS methodology as we wanted to be inclusive of both health and non-health literature and have the flexibility to adjust our inclusion and exclusion criteria (Dixon-Woods et al., 2006; Depraetere et al., 2021). We selected this review approach because we wanted to set out a broad and flexible search of the literature—including both qualitative and quantitative studies from multiple sectors, which we could analyse iteratively. A reporting checklist for CIS reviews does not currently exist. However, as we wanted to ensure transparent and rigorous methodology, our methodology was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews Checklist (Tricco et al., 2018). (See the supplementary file in the online supplementary material for a completed checklist).

In the context of the CIS, we conceptualized the process of conducting PPA as the phenomenon of interest, and our goal for the review was to better understand the phenomenon and develop arguments for whether and how to apply it. Unlike other applications of CIS, our phenomenon of interest was a process, and our synthesis would not directly lead to theory development. Nevertheless, given the heterogeneous body of literature we were expecting to analyse, this methodology seemed to provide the best balance of rigour, transparency and flexibility.

The CIS methodology suggests several phases of work (Dixon-Woods et al., 2006; Depraetere et al., 2021), which in our case were implemented as part of three phases—literature identification, screening and quality appraisal, and analysis and synthesis. Each of these is detailed further below.

Phase 1: literature identification

LP and RY designed and refined the search strategy with the assistance of an informationist at the Welch Medical Library. However, the methodology was iterative to allow for the adaptation of the initial search strategy to the grey literature and further iterations as a result of key informant consultations. Ultimately, we pursued several strategies, including reference chaining, grey literature searches and key informant discussions to complement the search of electronic databases. We did not restrict our search based on the affiliation of authors, discipline or geographic scope. Table 1 summarizes our inclusion and exclusion criteria.

We searched the following major databases: EMBASE, SCOPUS, PAIS Index, Web of Science and World Wide Science. The search terms and associated results are given in Table 2. The final search was conducted in June 2021 and verified in July 2023. In addition, we purposively reviewed and screened the empirical articles among the 10 articles selected in the World Health Organization Alliance for Health Policy and Systems Research’s Health Policy Analysis Reader, Part D1: Using health policy analysis prospectively to influence policy change.
We did not formally appraise quality, but the reviewers informally assessed empirical quality and analytical completeness at the screening and extraction phases, drawing upon the appraisal prompts suggested by Dixon-Woods et al. (2006). At the screening phase, because PPA is an emerging topic, we erred on the side of broader inclusion, and we did not exclude any articles due to quality concerns. At the analysis phase, as part of extracting relevant information from the final set of articles, reviewers interpreted each paper’s credibility and contribution based on whether the methods and analyses were adequately detailed so that others could potentially replicate it. We excluded one article due to quality concerns at this phase. The articles identified covered a wide range of topics and methods, and—because it became apparent early on in our review that it would not be possible to build a coherent theory from our review—we did not use the potential for a study to contribute to theory-building as an inclusion/exclusion criterion, or as a measure in our quality appraisal.

Phase 2: screening and quality appraisal

Two study team members (LP, RY) independently screened the title and abstracts and resolved disagreements through discussion. JL, OO, RY, and LP conducted a second round of screening, examining full-text versions of the articles that had been included thus far. Articles were included for full-text screening if authors explicitly mentioned using PPA, regardless of the methods or study designs used or whether the methodology used was completely described. If authors did not mention using PPA, we included the article if the authors incorporated real-time monitoring of policies or policy processes. We only included articles published in English or French. We did not restrict the search based on years, geographic location or health sector-specific topics because we expected the body of literature to be limited. While we screened book chapters and doctoral theses from which specific chapters could be included, we excluded books, commentaries, conference abstracts, as well as any articles where PPA was mentioned as a potential methodology for future research, and any studies that were of low empirical quality or of poor analytical completeness.

We adapted the inclusion/exclusion criteria as the definition of PPA became clearer. For example, we initially included some articles on real-time analysis of stock market data and other financial information. After reading the full text and discussions within the team, most of the articles were excluded. For example, some articles, like Collins et al. (2017), simulated future scenarios to evaluate the potential impact of current policies but did not monitor such policies in real-time. Others, such as Akram (2011), used large sets of macroeconomic data to test the validity of models in use—in this case, International Monetary Fund’s monetary model. Data in financial markets, often based on model predictions which are then revised based on real-time estimates to correct for prediction errors, differs from the actual data used prospectively or in real-time in most other analyses. Therefore, most articles were excluded either due to a lack of policy evaluation, the analysis being retrospective or the real-time analyses being used to correct model prediction errors rather than to examine a policy process in real-time. Additionally, at the full-text review stage, we excluded articles if we could not access the full text, if there was no actual policy being investigated or analysed, and if there was no real-time policy monitoring or any prospective component to the work.

Table 1. Inclusion and exclusion criteria for peer-reviewed literature

<table>
<thead>
<tr>
<th>Inclusion</th>
<th>Exclusion</th>
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<tbody>
<tr>
<td>Explicit application of PPA, regardless of methods used to do so</td>
<td>Mention of PPA as a potential methodology for future research</td>
</tr>
<tr>
<td>English or French language</td>
<td>Low empirical quality or analytical completeness</td>
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<tr>
<td>Any study designs</td>
<td>Books</td>
</tr>
<tr>
<td>Complete description of methodology used</td>
<td>Commentaries</td>
</tr>
<tr>
<td>Any years</td>
<td>Any topics</td>
</tr>
<tr>
<td>Any settings</td>
<td>Book chapters, theses, study protocols</td>
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</tbody>
</table>

Phase 3: analysis and synthesis

Articles retained after the full-text review were transitioned to the extraction stage. The study protocols that were identified were retained at full-text review but were analysed separately from empirical papers. To help with the extraction of relevant information from the included articles, we developed a form containing data entry fields that matched domains of interest linked to our study objectives (e.g. the research setting, how authors defined ‘prospective,’ what methodology was used, and whether and how policymakers or other stakeholders were engaged). Data extraction was conducted by OO, RY, JL, and LP.

Our analysis identified recurring concepts and themes related to PPA through an iterative approach whereby we coded each extraction field and then compared codes across studies to identify recurring themes. We discussed emerging findings and themes as a group, refining our themes and results based on our findings. Themes were refined as new data were obtained and all authors contributed to refining the final synthesis and associated outputs.

The CIS methodology emphasizes the importance of formulating a synthesizing argument in the form of a coherent theoretical framework including a network of constructs and the relationships between them based on the themes identified from the data extraction (Depraetere et al., 2021); according to the key descriptions of CIS methodology, the synthesis should use an inductive meta-ethnographic technique in order to do so (Depraetere et al., 2021). We formulated our synthesizing argument by reflecting on the themes that resulted from the extraction analysis and refined it by iterating among team members (Depraetere et al., 2021). Our synthesis drew on inductive and deductive techniques because our review primarily focused on describing the concepts related to the phenomenon of PPA and did not fully reach into the theory development aspects.

Results

After screening 429 articles in total, our team included a final set of 35 articles for extraction and 4 study protocols (Figure 1). Among empirical articles, the majority (26/35) were written on a health policy topic, such as the UK
government’s COVID-19 policy (Cairney, 2021), disability policy in Namibia (Chichaya et al., 2018) or reproductive health policy (Storeng et al., 2019). Among the articles not describing health policy analyses, some examined social policies, such as well-being (Carter, 2012), housing (Yau and Ho, 2017), welfare reform (Bishop, 2003) or violence (Considine et al., 2014). Others analysed policies on nanotechnology (Kuzma and Priest, 2010), energy (Collins et al., 2017 Grösser, 2013), economic governance (Salder, 2020) and foreign policy (Bing, 2017). The four study protocols that were retained in our review were similarly diverse, describing research on policies at the nexus of health and urban issues, such as physical activity (Fathi et al., 2021), food security (Patay et al., 2022) or sugar-sweetened beverage taxes (Thow et al., 2021). One of the four study protocols was outside the health domain—examining electric vehicle charging station policies (Grisham, 2023).

Based on our analysis of the final data set, all articles were published since 2003. Though Buse, 2008 made the case for building up the literature on PPA, we observed only a slight increase in the number of articles published every year, without any conclusive trends (see Figure 2). We observe small increases in the number of publications per year in 2015 and 2017. However, these appear linked to multiple publications from the same study, where 5 of the 13 articles published in this period reported on the Trans-Pacific Partnership (TPP) (Makan et al., 2013; Hirono et al., 2016; Lexchin and Gleeson, 2016; McNamara and Labonté, 2017). All of the included articles were authored by researchers based in academia, though policy stakeholders at various levels (e.g. state and federal government, district officers, civil society) were mentioned. With a few exceptions, we could not determine whether and how the research conducted was embedded in a policy process, nor whether any policy stakeholders were engaged in the research. Reeve et al.’s study is an exception and their work is most closely related to the type of analysis suggested by Buse (2008)—the authors implemented an action-oriented approach to PPA, in the context of an advocacy coalition taking advantage of a policy window of opportunity (Reeve et al., 2021). The authors described their policy engagement activities in detail, in addition to the more traditional data collection approaches used (Reeve et al., 2021). Tantivess and Walt (2008) conducted participatory observation and personal communications with Thai policymakers and government officials involved in policy dialogues. Considine et al. (2014) engaged policy-makers through scenario discussions to determine whether policy-makers had the skills, expertise and experience to tackle policy issues, and Carter (2012) reports on engaging policy-makers through an extended period of time via ethnographic methods. In most other studies, researchers included policy-stakeholders as key informants through data collection, at times through multiple data collection rounds (Bishop, 2003; Buse et al., 2009) or a Delphi process (Yau and Ho, 2017).

Regarding scope, two-thirds of our final articles (24/35) reported findings from a single country. The remaining one-third had a global scope (Bump et al., 2012; Michinobu, 2015; Whelpton et al., 2015) or presented multi-country analyses (Makan et al., 2015; Michinobu, 2015; Labonté et al., 2016; Lexchin and Gleeson, 2016; Collins et al., 2017; Harris et al., 2017; McNamara and Labonté, 2017; Storeng et al., 2019; Abdool Karim et al., 2021).

### Table 2. Search strategies by database, with the number of articles stemming from each

<table>
<thead>
<tr>
<th>Database</th>
<th>Search strategy</th>
<th>Number</th>
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<tbody>
<tr>
<td>EMBASE</td>
<td>‘prospective policy analysis’ OR ‘prospective health policy’ OR (‘prospective policy’ NEAR/3 ‘analysis’) OR (‘prospective’ NEAR/3 ‘policy analysis’) OR ‘real? time policy analysis’ OR ‘real time policy analysis’ OR ‘real time’ NEAR/3 ‘policy analysis’)</td>
<td>19</td>
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<tr>
<td>SCOPUS</td>
<td>TITLE-ABS-KEY [‘prospective policy analysis’ OR ‘prospective health policy’ OR (‘prospective policy’ W/3 ‘analysis’) ] OR (‘prospective’ W/3 ‘policy analysis’) OR ‘real/time policy analysis’ OR ‘real time policy analysis’ OR ‘real time’ W/3 ‘policy analysis’</td>
<td>40</td>
</tr>
<tr>
<td>PAIS index</td>
<td>(‘prospective’ NEAR/3 ‘policy analysis’) OR ‘real time policy analysis’ OR ‘real time’ NEAR/3 ‘policy analysis’) OR (‘real time’ NEAR/3 ‘policy’) OR (‘real-time’ NEAR/3 ‘policy’)</td>
<td>180</td>
</tr>
<tr>
<td>Web of Science</td>
<td>AB = (‘prospective policy analysis’ OR ‘prospective health policy’ OR ‘prospective NEAR/3 ‘policy analysis’ OR ‘real time policy analysis’ OR ‘real-time policy analysis’ OR ‘real time’ NEAR/3 ‘policy analysis’)</td>
<td>29</td>
</tr>
<tr>
<td>Worldwidescience.org</td>
<td>‘prospective policy analysis’ OR ‘prospective health policy’ OR ‘real time policy analysis’ OR ‘real-time policy analysis’ - Unclick multimedia, data and software, multilingual resources - Unclick Pub Med Central - Unclick Indian Institute of Science Theses &amp; Dissertations (India) - Exclude books - Limited to full text - No date range set - Consider only top results</td>
<td>205</td>
</tr>
<tr>
<td>WHO Alliance for Health Policy and Systems Research Health Policy Analysis Reader</td>
<td>Empirical papers among the 10 articles selected for section D1: Using Health policy analysis prospectively to influence policy change</td>
<td>10</td>
</tr>
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</table>
Regarding geographic representation, we found 23 instances where policy case studies from 12 World Health Organization (WHO) Africa Region countries were analysed. WHO Western Pacific Region had 21 mentions among our articles, most of the literature coming from Australia (6 mentions), Japan (3 mentions) and Vietnam (3 mentions), and generally centres around the studies on the TPP (Michinobu, 2015; Hirono et al., 2016; Labonté et al., 2016; Lexchin and
Gleeson, 2016; Mcnamara and Labonté, 2017). The WHO Americas Region had 15 mentions, 5 from the USA and 4 from Canada—most of them linked to the TPP articles. Two of the TPP articles account for the 6 mentions of Peru, Chile and Mexico (Labonté et al., 2016; Mcnamara and Labonté, 2017). WHO Southeast Asia region countries had 8 mentions, and the Eastern Mediterranean and European regions each had 5 mentions. Using the World Bank designations for fiscal year 2024 (World Bank, 2023) and excluding the three articles that published a global level analysis, high-income economies were mentioned 15 times, upper-middle-income ones 8 times, lower-middle-income ones 12 times and low-income ones 5 times. The study protocols were all published since 2021, signalling that more PPA studies might be undertaken in the future (Fathi et al., 2021; Thow et al., 2021; Patay et al., 2022; Grisham, 2023).

How was PPA defined, and what was prospective about it?

We were interested in understanding how PPA is defined in the literature. Though PPA is documented in published literature and classified by some articles as a distinct form of analysis, documented examples do not use the term consistently.

However, while most articles cited Buse (2008), only 7 of 35 included articles captured the authors’ definition of PPA (Pearson et al., 2010; Surjadaja and Mayhew, 2011; Collins et al., 2017; Michinobu, 2015; Veglia et al., 2017; Reeve et al., 2021). Overall, these articles defined PPA as forward-looking, documenting real-time data and learning (Reeve et al., 2021). ‘Applied prospectively, policy analysis can be utilized to formulate an effective response to policy problems before policy actions are carried out by developing a nuanced view of the policy problem’ (Reeve et al., 2021) that includes the past and present (Michinobu, 2015; Reeve et al., 2021), includes key issues and players (Veglia et al., 2017), generates policy options (Michinobu, 2015), and ‘[provides] timely advice towards meeting policy objectives that are sensitive to local contextual factors and constraints’ (Buse, 2008; Reeve et al., 2021). Though Buse’s 2008 article suggests that prospective policy analysis can be used to reveal policy windows and to identify the information and resources required to drive policy change (Buse, 2008), the articles in our review did not necessarily emphasize this particular element. However, Reeve et al. linked to the Buse definition most closely, and suggested that ‘prospective policy analysis research can take the form of action-oriented research’ when it includes an emphasis on engagement and knowledge translation to support policy change’ (Reeve et al., 2021). Finally, Veglia et al. emphasized the value of prospective policy analyses ‘for establishing evidence-informed policies’ (Veglia et al., 2017).

The articles that defined PPA within our review most frequently mentioned four features: forward-looking, real-time data documentation, real-time learning, and, at least in one case, including key issues and players (Veglia et al., 2017; Reeve et al., 2021). There was little discussion of the deeper meaning of these features, however. For example, the authors did not clarify the time horizon or approach for delineating a time horizon for bounding real-time data documentation and learning. Furthermore, most articles did not document in detail the rationale, process and outcomes of policy stakeholders’ engagement, nor, per Buse (2008), whether the information generated from PPA equipped them with the evidence needed to engage better in the policy process.

What was the purpose of conducting PPA?
The authors’ intentionality or purpose for conducting PPA was difficult to determine and was inferred by our team from the authors’ description of the analysis process. Some articles described PPA conducted ahead of a policy being implemented. Most of those articles used PPA to assess the feasibility of proposed policy options (Buse et al., 2009; Pearson et al., 2010; Daire et al., 2018; Bazyar et al., 2020; Abdool Karim et al., 2021) or the impact of a policy (Kuzma and Priest, 2010; Milani, 2010; Carter, 2012; Grösser, 2013; Labonté et al., 2016; Lexchin and Gleeson, 2016; Bing, 2017; Cobiac et al., 2017; Harris et al., 2017; Mcnamara and Labonté, 2017; Salder, 2020; Cairney, 2021; Zebrowski et al., 2021). Several others used PPA to propose policy options or to otherwise inform the policy process (Tantivess and Walt, 2008; Surjadaja and Mayhew, 2011; Considine et al., 2014; Collins et al., 2017; Veglia et al., 2017; Yau and Ho, 2017; Chichaya et al., 2018; Storeng et al., 2019; Pybus et al., 2021). A smaller number of articles intended to use this analysis to inform policy advocacy (Bump et al., 2012), to inform advocacy and propose policy options (Reeve et al., 2021), or to assess the impact of a policy in a predictive fashion before a policy was designed (Thow et al., 2015; Hirono et al., 2016). One of the articles evaluated the impact of a policy in real-time (Higuchi, 2008). Four of the articles used the analysis to support policy implementation (Bishop, 2003; Makan et al., 2015; Michinobu, 2015; Pybus et al., 2021).

What types of research questions do the articles cover, and what are the policy characteristics and topics covered?
The topics covered by the articles we examined were diverse and did not lend themselves to a specific categorization. Most of the articles that we identified (26/35) revolved around a public health topic. The remainder focused on urban planning (Grösser, 2013; Yau and Ho, 2017), trade policy (Thow et al., 2015), sustainable development (Collins et al., 2017), sub-national economic governance arrangements (Salder, 2020), public policy (Considine et al., 2014), welfare or social security policies (Pybus et al., 2021), fiscal policy (Milani, 2010) or biotechnology (Kuzma and Priest, 2010). We found cases of PPA that concerned both big ‘P’ policies and little ‘p’ policies. Big ‘P’ policy analysis covered topics such as trade negotiations for the TPP (Hirono et al., 2016; Labonté et al., 2016; Lexchin and Gleeson, 2016; Mcnamara and Labonté, 2017), sugar-sweetened beverage taxes or other taxes and subsidies to improve diet and population health (Cobiac et al., 2017; Abdool Karim et al., 2021; Reeve et al., 2021), national health insurance schemes (Bazyar et al., 2020), social security schemes (Pybus et al., 2021) and foreign policy (Bing, 2017). Little ‘p’ policies driven by or most pertinent to local governments were reported in articles that took a deeper dive into a single country’s context. One example was Carter’s, which conducts an ethnographic observation of a community-learning partnership as it implemented a national children’s welfare policy (Carter, 2012). Another example is Tantivess’, which examined the relationship between national, provincial, and district processes and networks related to
implementing anti-retroviral treatment policies in Thailand (Tantivess and Walt, 2008).

At which point in the policy process does PPA occur?

We examined at what point in the policy process PPA was situated. We used the stages in the simple policy cycle for organizing purposes, but not assuming that we could overcome or grapple with its limitations in this endeavour (i.e. that it oversimplifies a complex process involving many actors without fully explaining it and that it presents a series of stages that are not necessarily sequential). We specifically examined agenda setting, policy formulation, policy implementation and policy evaluation. We found that most articles focused on only one stage of the policy process.

Most articles dealt with a single stage of the policy-making process—either agenda setting (Grösser, 2013; Daire et al., 2018; Storeng et al., 2019) or policy formulation (Pearson et al., 2010; Considine et al., 2014; Makan et al., 2015; Lexchin and Gleeson, 2016; Cobia et al., 2017; Veglia et al., 2017; Yau and Ho, 2017; Bazyar et al., 2020; Abdool Karim et al., 2021; Zebrowski et al., 2021), or either policy implementation (Bishop, 2003; Higuchi, 2008; Carter, 2012; Alal, 2015; Thow et al., 2015; Thow et al., 2017; Daire et al., 2018; Storeng et al., 2019; Reeve et al., 2021), and the constituents themselves (Bishop, 2003; Pearson et al., 2010; Makan et al., 2015; Thow et al., 2015; Veglia et al., 2017; Chichaya et al., 2018; Pybus et al., 2021; Zebrowski et al., 2021).

Three articles reported the use of content analysis (Bishop, 2003; McNamara and Labonté, 2017; Bazyar et al., 2020), though there may have been additional ones that analysed public documents and drew on this approach but did not report details about their analytical approaches. Articles drawing on secondary quantitative data also reported modelling techniques such as system dynamics models to develop future policy scenarios (Collins et al., 2017), spatiotemporal compartment models (Zebrowski et al., 2021) and market models (Milani, 2010). In one article, the policy analysis also drew on a health-impact assessment (Labonté et al., 2016).

Most articles collected data over a period of 1 year or less. Several of the articles using primary data used longitudinal designs, collecting data often through multiple rounds generally over a period of 2 (Surjadjaja and Mayhew, 2011; Michinobu, 2015; Reeve et al., 2021) to 3 (Daire et al., 2018; Storeng et al., 2019) years. The longest period was Harris’ study around changes in the policy environment for infant and young child feeding from 2010–2014 (Harris et al., 2017). The study designs and data used across these studies were too diverse for us to identify a cohesive set of related strengths and weaknesses. However, the complexities of policy processes might be difficult to disentangle by using secondary data alone. As one might expect, studies that used multiple forms of data, collected over multiple rounds, seemed to provide the richest information about the policy process under review.

What methods were used to conduct PPA?

Case study designs were reported most frequently, centred around qualitative inquiry techniques taking the form of semi-structured in-depth interviews, stakeholder consultations and participant observations. About half of all of the articles included in this review (17/33) used a mix of primary and secondary data sources, such as an analysis of public documents and policies, which in a few cases also included media sources (Tantivess and Walt, 2008; Surjadjaja and Mayhew, 2011; Bing, 2017; Daire et al., 2018; Storeng et al., 2019; Bazyar et al., 2020; Abdool Karim et al., 2021; Pybus et al., 2021). Only one of the articles reported using social media and news media (Tantivess and Walt, 2008). Two studies reported using leaked text or policy documents (Thow et al., 2013; Hirono et al., 2016). A total of 6 out of 35 used primary data collection only, and 12 out of 35 used secondary data only.

Of the study designs examined, only a few used participatory techniques. For example, Pearson et al. (2010) and Yau and Ho (2017) used the Delphi technique, drawing on expert panels, Grösser et al. (2013) drew on participatory development of causal loop diagrams, and Pybus et al. (2021) described using data collected from policy beneficiaries using online diaries, participatory discussion groups and arts-based methods. A couple of studies used social network analysis (Harris et al., 2017) or network mapping (Storeng et al., 2019), although it was not clear the extent to which those processes were participatory. Most authors reported collecting data only from policymakers from government institutions, cabinet members, experts affiliated with multi-lateral or bilateral global health agencies, and multi-national corporations. A few also included or acknowledged the perspectives of health practitioners or service providers (Bishop, 2003; Higuchi, 2008; Surjadjaja and Mayhew, 2011; Makan et al., 2015; Chichaya et al., 2018; Storeng et al., 2019), civil society or advocacy organizations (Tantivess and Walt, 2008; Pearson et al., 2010; Makan et al., 2015; Thow et al., 2015; Thow et al., 2017; Daire et al., 2018; Storeng et al., 2019; Reeve et al., 2021), and the constituents themselves (Bishop, 2003; Pearson et al., 2010; Makan et al., 2015; Thow et al., 2015; Veglia et al., 2017; Chichaya et al., 2018; Pybus et al., 2021; Zebrowski et al., 2021).

What was the final product of the research analysis, and who was in the audience?

The final product of the analyses reported were almost always academic articles, though this assessment might be skewed due to the nature of the literature review. A few articles mention additional deliverables, such as a guide on how to develop occupational cancer primary prevention strategies (Veglia et al., 2017) or a stakeholder analysis to guide stakeholder engagement (Makan et al., 2015), but this did not always match with the studies that actually engaged stakeholders [e.g. Makan et al. (2015) did not report stakeholder engagement]. A number of articles reported producing policy options or policy recommendations (Buse et al., 2009; Pearson et al., 2010; Grösser, 2013; Michinobu, 2015; Thow et al., 2015;
Chichaya et al. (2018), and two articles specifically noted the development of multiple products, such as reports geared towards decision-makers, in addition to academic articles (Lexchin and Gleeson, 2016; Pybus et al., 2021). Reports on the dissemination of findings were mixed, however. In total, 16 out of 35 articles reported on some form of dissemination, whereas the remainder did not report on any intention to disseminate outputs or that they disseminated during their research.

In line with the CIS methodology, each article extracted also underwent a quality assessment. We found that most articles provided sufficient information about study design and context, yet a considerable proportion did not include key details about how the prospective policy analysis was carried out (i.e. what data was used, how it was analysed, over what period) and how the authors defined the prospective nature of the context.

A framework to inform the design and evaluation of PPA studies

In the concluding section of our findings, we synthesize the themes that emerged about conducting PPA into a guiding framework. The articles obtained through this review were quite diverse and did not use a consistent application or definition of PPA. Therefore, we do not contribute to building a concrete theory, as one ideally would expect through a CIS. As our final data set contained only researcher-led PPA examples, our framework might be most relevant for researchers interested in designing and evaluating future PPA studies. However, as researchers are not and should not be the only ones using PPA, we believe that our framework is also relevant to practitioners and policy analysts who may not be based in academic settings. While the framework begins to highlight some key domains, important gaps remain. We use this opportunity to reflect on the aspects that make PPA unique within the broader realm of policy analysis approaches and methodologies, as well as to highlight where there are gaps that future research can help to fill. Figure 3 presents the framework, using dashed lines to outline the fields and concepts that require further exploration and validation.

Our framework situates PPA in the process of providing decision-makers with data and evidence necessary to understand a policy problem and select among potential solutions. Although not unique to PPA, important related outputs include timely results and real-time learning, as well as the development and strengthening of policy networks, which also include those conducting the research.

On the left-hand side of Figure 3, we highlight the importance of understanding policy characteristics and assume that the Walt and Gilson Policy Triangle Framework can be a simple and intuitive way to describe the policy process—featuring the policy content, process, context and stakeholders (Walt and Gilson, 1994). We then describe a set of features that might set PPA apart from other forms of policy analysis. These characteristics begin with the ‘objective for PPA’ linked to a dynamic policy period and a specific ‘intent’ to conduct a PPA. The intentionality is important for creating or opening the spaces and ‘mechanism(s) for engagement’, which often might require additional tangible resources (e.g. time, money, facilitation), as well as intangibles, such as trust among the actors involved. The mechanism(s) of engagement bring focus on the relationships among actors engaged in the policy process and have two dimensions; researchers as analysts supporting national networks, such as advocacy coalitions; and researchers leading PPA to engage ‘policy actors’. Finally, the PPA strategy or approach should be designed to promote the development of timely and synchronous results, linked to the dynamic ‘processes’ of the dynamic policy period. We list these elements separately, but in the articles we explored, they were intertwined. The mechanisms for engagement depend on how the researchers and practitioners are, under which institutional arrangement they operate, and whether and how they engage with existing networks and coalitions of relevant actors. Researchers or practitioners would ideally have pre-existing engagement or an embedded role in the policy process, which requires time and resources to activate. The researcher’s or practitioner’s positionality—i.e. the social and political contexts that shape their identity and world view—including their credibility and ability to engage and communicate with policymakers, are also essential to understand in order to be able to reflect on and learn from how their motivations and assumptions influence decision-making in a PPA context. The engagement mechanisms are also tied to the research design, which depends on the availability of real-time, longitudinal data and/or the resources and opportunities to carry out longitudinal study designs. While these features were not present in every study, we noted that the articles where the application of PPA was explicitly described touched on all of them. Further investigation is needed to confirm whether these characteristics are indeed unique to PPA. Additional inquiries are also needed to establish whether distinctions exist between PPA carried out by researchers, similar to the studies we identified, or PPA carried out by policy analysts or other types of practitioners, not based in academia.

Furthermore, we recognize that an output of some PPA is the process of research and engagement itself and that there are barriers and facilitators to this process. For example, timing PPA to follow a policy process across more than one stage or at particularly dynamic periods (e.g. from agenda setting to policy formulation or from policy formulation to policy implementation) or in response to an urgent policy request might facilitate PPA contributing to evidence-informed decision-making more completely. Insufficient time and resources to do so might serve as barriers. A researcher or practitioner’s social capital and trust for engaging and communicating with policy-makers could serve as a facilitator, as well as a contributor, to some of the additional outcomes we list, such a timely results and real-time learning.

This framework might be most useful to researchers supporting the policy process, as a heuristic for the key elements of PPA, which can affect how PPA is designed and reported on. Specifically, it could help researchers reflect and be more transparent and deliberate about whether and how their research supports the policy process and the degree to which it is embedded or engages policy stakeholders—whether in government or in civil society. The framework could also be used to teach about PPA in the context of policy analysis more broadly and embedded research techniques. Publishing study protocols featuring PPA, similar to the work of Thow et al. (2021), could provide an important opportunity for learning among researchers and research funders concerned with policy analysis, embedded research or evidence-based decision-making. Better reporting of PPA by researchers can
help build the field further. Our review did not identify published versions of practitioner-led PPA.

It is worthwhile mentioning that although we drew the elements for the framework from the literature reviewed, no single study or study protocol reported on all the mentioned elements, nor could it be ascertained whether such elements were deliberately considered in the design or reporting of the PPA. Inevitably, reporting PPA findings through peer-reviewed articles can only provide a brief window into the underlying process of engaging in a policy process. Over time, however, increased reporting on and documentation of PPA would hopefully have two positive spillover effects—greater awareness and appreciation of PPA and more resources to build the capacity for future researchers and practitioners who seek to engage deeply in policy processes.

**Discussion and conclusion**

Our review set out to identify how PPA has been used thus far in policy analysis, with the broader aim of understanding the key features of PPA and how they are put into practice. While we found several examples of PPA, most emerged recently and are primarily used in health policy analysis. Although our search strategy was not limited to health, the outputs of the search were almost exclusively health oriented, giving our review the flavour of PPA focused on health-sector issues. Even among PPA examples, the methods and approaches used were most often summarily described in their study designs and reported on relatively short prospective time horizons. Most of the studies stemmed from high-income countries and, across our sample, did not always clearly outline the rationale for a PPA and how this analysis was conceptualized. Only about one-fifth of the articles explicitly defined PPA, underscoring the fact that researchers should better document their intent when carrying out PPA and reflect on the elements that are key to this analysis type. It may also point to issues with how PPA is typically defined (or not) in the literature, as well as to the need to reconsider the term ‘PPA’ in favour or more intuitive and descriptive substitutions, such as ‘real-time’ analysis. Despite a recognition that policy processes are dynamic, that examining policies from multiple angles and over time is important, and that rigorous, empirical examples of PPA are needed, the PPA approach is not currently widely reported and most of the reports found in the literature reflect researcher-led PPA (Buse, 2008; Weible et al., 2012; Gilson et al., 2018). We reflect on several reasons why this might be the case. Researchers might be embedded in policy processes prospectively, but do not necessarily package their studies or label these analyses as PPA. Additionally, Gilson et al. (2018) observe that this might be the case because most of the engagement is led by practitioners rather than researchers, and Buse (2008) states that those doing the work (e.g. advocates, policy strategists) are not intending to publish academic articles. PPA might be led from within a government unit in charge of policy analysis or within an independent local or regional think tank, neither of which incentivize reporting on findings through peer-reviewed publications.

The peer-reviewed journal article format, due to its relatively short form and sharp focus and its publication lag, is rather limiting for analyses that span a long period of time. Publication bias could also disincentivize reporting on PPA as such—engagement in the policy process is not always successful by traditional measures, and documenting successes might be easier to do retrospectively. Additionally, due to the political and sensitive nature of policies and processes, embedded policy analysis and stakeholder engagement can often occur informally and ad hoc, especially in settings where the government does not regularly sustain stakeholder engagement through town-hall meetings or structured testimonies and hearings. The sensitivity of engaging in the policy process might mean that certain issues cannot be published or disclosed publicly until after the fact. Therefore, reporting on PPA might always have a retrospective feel, though the analysis and engagement would happen in real-time or close
to real-time. Our literature review consequently did not pick up important work, such as that written by Sengooba et al., documenting their engagement with results-based financing policies in Uganda, and not explicitly called PPA (Sengooba et al., 2021). It also did not register the work of academic teams that bridge the space between research and policy, such as the American University of Beirut’s Knowledge to Policy Center (American University of Beirut, 2023), which is a WHO-designed Collaborating Center for Evidence-Informed Policy and Practice, which regularly publishes both academic and non-academic research products (e.g., briefing notes, policy dialogues, citizen consultations) and engages in both local and regional health policy. Furthermore, because our review was focused on the published literature, it did not include or analyse tools and methods that policy-makers are using for real-time policy monitoring or policy processes (Council Office of Racial Equity, 2023a,b). An expanded review would enrich the proposed synthesis framework and potentially expand the conceptualization of PPA.

The articles that used PPA did not report on the underlying assumptions or intentionality for why the prospective, real-time engagement was necessary or useful to influence a particular policy ecosystem. Nor did the authors reflect on how they saw the evidence generated by the policy analysis used in the policy domain. Deborah Stone and others emphasize the importance of reflecting and being reflexive about the researchers’ approach to studying a particular policy, including why (Stone, 2011). In theory, PPA, due to its embedded nature and long-term engagement might seem to be more likely to capture the ‘black box’ of policymaking. In practice, and in these articles that we identified, we found insufficient discussion about the role of researchers in the policy process, i.e. how to create space for the embedded role of evidence and researchers in the policy process. Further, at least in these articles, there is little to no exploration of less traditional and non-academic methods of engaging in policymaking, such as those supporting strategic persuasion, public opinion data collection, hearings or testimonies, and storytelling, and whether or how researchers can support these with analysis of resulting data.

Our synthesis framework underscores the issue that without some intentionality about doing PPA, it is unlikely to happen informally or organically—furthermore, it is even less likely to be researched and reported as such. This is important for future researchers of PPA in this realm. It also highlights the importance of PPA outputs and the feedback integral to knowledge translation. The feedback component—i.e. how the PPA outputs were used—was rarely reported in the literature, though it is essential to create a link between the research/practice and the decision-making space. If products or knowledge translations are informal, documenting would be more difficult. Our framework does not develop a theory per se, but intends to support researchers and practitioners conducting PPA with a structure for designing and evaluating PPA. More broadly, it intends to connect the constructs emerging from our review and outline the relationships between them (Depraetere et al., 2021). It would be interesting and vital for future research to assess this framework and determine its practical utility. Equally important would be to link up learnings from attempts to engage in PPA and report on it with broader discussions of the role of researchers, both those in academic institutions, as well as those in think tanks or policy bodies, in the policy process, along with the benefits and drawbacks of such engagement, which is a discourse ongoing in the academic research space, as evidenced by Cairney and Oliver (2020).

Several limitations hampered our review. First, identifying PPA in peer-reviewed journal articles is difficult, considering that the timing of publications results in retrospective reporting even if the research was conducted prospectively. Second, because our search used only ‘prospective’ and ‘real time’ as key words, we may have limited the search yield and, therefore, likely missed some published examples because they would not have explicitly mentioned these specific operative keywords. Third, we found that several articles reported a PPA but did not report on a specific use of the findings, nor could we ascertain the use of findings from the policy analysis beyond the articles we analysed. Because of the nature of the peer-reviewed literature, we could not follow through on any developments after the publication date nor could we gather an in-depth description of the policies studied or the related policy processes engaged. Overall, the fact that academic institutions led most, if not all, of the studies reported in the peer-reviewed literature may simply mean that academics do not often carry out PPA and that the real-time policy analysis carried out by policy practitioners, think tanks and advocacy groups is not documented in this realm or not documented at all. The team members designing this review were public health researchers, this perspective perhaps influencing our review process and biasing us towards domains close to public health, which were more familiar to us. When we set out to conduct the review, our implicit assumption was that PPA methods could be applicable to all types of policies. Our review confirmed this assumption given that the included articles were so diverse—however, a separate review would be needed to delve into the policy themes more deeply, including content, process and actors, and the conditions under which PPA might help contribute most to evidence-informed decision-making.

Nevertheless, we hope our review helped highlight what is important and unique about conducting a PPA and inspires more deliberate reporting on PPA features and more frequent applications of prospective analysis methods. Health policy and systems researchers who are either already working closely with decision-makers on embedded research projects or who would like to do so in the future might draw on this review and the featured studies to design similar analyses. Academics who teach health policy analysis and who contribute to building the capacity of future generations of policy analysts may draw upon this review in their classrooms to provide examples of conducting forward-looking and real-time policy analyses. Among researchers based within academia, the gaps that this review points to will hopefully inspire additional discussion about how to better learn about real-time policy analyses happening outside of the sphere of academia. Future research should delve deeper into the literature around other iterative analysis approaches that can be used for policy analysis, embedded research models, as well as knowledge to action think tanks to document lessons learned. Researchers should learn further about whether and how political actors and decision-makers use social and news media, to test the aforementioned assumption that these are not frequently systematically incorporated in policy analyses. Researchers should also explore the characteristics of academics who

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conduct and report on PPA, including in which institutions and geographies they are based, as well as barriers and facilitators for conducting this type of research, and whether and how they engage with policy-stakeholders. Future studies should also feature an analysis of the types of policies and policy processes for which PPA is most appropriate, including whether they are of high or low priority at a particular place and time, and whether windows of political opportunity exist. Future studies could focus on building the field to support more researchers and practitioners to engage in PPA. This could include examples of creatively designing and reporting on PPA, testing and refining the proposed framework, as well as filling in the illustrated gaps. Even when researcher engagement with policy actors—whether government affiliated or part of national advocacy coalitions or other similar networks—might not be feasible, real-time policy monitoring might have value in and of itself, to understand how policy is made, the factors that promote or hinder the use of research evidence, and the actors, their relationships, and the roles that they play at various times in the process. Attention should be given to new tools and technologies that could support rapid analysis, as well as to data science approaches for analysing big data, as well as to mixed methods research, which brings together rich qualitative data with secondary data sources. The role of rapid policy analyses and the role of academics and practitioners as knowledge brokers and intermediaries in the research to policy dialogue, and how relationships develop over time in policy processes, should be further explored.

Supplementary data
Supplementary data is available at HEAPOL Journal online.

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Authorship
The review analyzed the global literature and did not focus on any particular country or region. The grant that funded this review was a small grant which only covered time for the principal researcher and graduate students. For these two reasons, we did not have the opportunity to work closely with international collaborators. We hope that our findings shed light on opportunities where international collaborators, especially those from low- and middle-income countries can further build the field, based on their local experiences engaging in policy discourse. The masters’ student practicum was funded through a small grant from the JHSPH Center for Global Health’s Global Health Established Field Placement Program, which promoted remote practicums while pandemic-related travel restrictions were in place.

Author contributions
Conception/design of the work: L.P. Data collection/data curation: L.P. and RY. Data analysis and interpretation: O.O. and J.L. Drafting the article: L.P. and R.Y. Critical revisions of the article were carried out by all authors. All authors gave final approval of the version to be submitted.

Reflexivity statement
All of the authors who conducted this review are based at a single, high-income country institution and worked collaboratively on this review of the global literature. The team was comprised of two professorial faculty members who provided mentorship to two doctoral students and two masters students. One of the masters students completed part of their practicum requirements through their contributions to this review. The critical review and edits provided by colleagues from the Engineering School supported their broader involvement in designing an application of prospective policy analysis. The team fostered a gender-balanced environment and respectful sharing of individual perspectives, from everyone’s diverse backgrounds.

Ethical approval. Ethical approval for this type of study is not required by our institute.

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