THE ROLE OF POLICY ANALYSIS IN NATIONAL IMMUNIZATION PROGRAMS: A SCOPING REVIEW

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ABSTRACT

Policy analysis is widely being used in multiple disciplines such as politic, economy, social, history and administration. It has a variety of definition as it is variously defined by different scholars. This is no exception to the health sector especially in the nationwide program such as immunization. In order for the immunization programmes to be successful, it primarily depends on up-to-date policies and its effectiveness to ensure their goals to be achievable and to secure its sustainability. This manuscript reviewed twelve articles to extract the roles of policy analysis. The aim of this manuscript is to review the role of policy analysis in selected countries regarding national immunization program policy. As the role of policy analysis has not been explicitly explained in literatures, the result of roles of policy analysis in this manuscript are extracted from the articles found in this scoping review. The roles are evaluating existing policy, modification of policy, formulating new policy, choosing best alternatives and prescribing recommendation. Most policy analysis plays not only one but multiple roles depending on the context of the policy. This results in the development of a framework to illustrate the roles of policy analysis and their interactions. Despite the simplicity of the framework of policy analysis, health policy analysis is indeed a tedious endeavour. By having a clear picture of what role it plays in making policy analysis, perhaps the process can be less daunting to ensure the effectiveness and efficiency of immunization policy.

Keywords: Policy analysis, roles, national, immunization, vaccination

1.0 Introduction

There is no single universally accepted definition of policy analysis. Since policy analysis is widely being used in multiple disciplines such as politic, economy, social, history and administration, it has a variety of definition as it is variously defined by different scholars (Walt and Gilson, 1994). According to Paul et al. (1989), it can be defined as "the task of analysing and evaluating public policy options in the context of given goals for choice by policymakers or other relevant actors" whereas Dunn (1981) defined policy analysis as "an applied social science discipline which uses multiple methods of inquiry and arguments to produce and transform policy-relevant information that may be utilized in political settings to resolve policy problems." Similarly, most of the definitions described policy analysis as a tool and method to evaluate the existing policies of how it came to be and what their impacts are (Collin, 2004). Health policy on the other hand, defined by WHO as "decisions, plans, and actions that are undertaken to achieve specific health care goals within a society."

There are two types of policy analysis which are analysis of policy and analysis for policy (Kent, Nicolas & Gill, 2012). The first type looks back at why and how a policy is established, its content and evaluating it whether or not the goals are achieved and why. Hence this type of analysis can be considered retrospective and descriptive. On contrary, the second type of analysis tends to be prospective as it is usually performed to inform the policy formulation as well as projecting the impact of the policy should it be introduced. It is vital to understand the world of policy as it is an essential foundation for action. By performing policy analysis, the nature of the policy can be further dug for better understanding, the history of how it emerges and unfolds can be revealed as well as grabbing every opportunity to shape and influence the policy for the sake of betterment (Gilson, Orgill & Shroff, 2018). Hence, policy analysis plays such a vital role in recommending a course of action for policy modification. However, the fact that policy analysis comes in varieties and can be considered as multi-faceted in nature makes it obvious that there is no one best way of conducting it (Mayer, Els van Daalen & Bots, 2004)

In 1796, a British physician named Edward Jenner had successfully inoculated patients against small pox using matter from cowpox pustules (WHO, 2019). After his method underwent medical and technological advancement spanning about 200 years, smallpox successfully eradicated. This significant milestone remains one of the major public health's successes. The Expanded Programme on Immunization (EPI) was later developed and launched by World Health Organization (WHO) in 1974 following the success of smallpox immunisation program and has been a solid foundation for other immunization programmes throughout the world. The initial goals were solely focused on achieving the targets in term of coverage but soon changed its goal to the control and elimination of major childhood diseases (WHO, 1996). Tuberculosis, polio, pertussis, diphtheria, tetanus and measles are the main six childhood diseases focused by WHO at that time. The middle of the 20th century witnessed such a rapid vaccine research and development with new techniques and methods for growing viruses eventually led to the discoveries of new vaccines targeted on other common childhood diseases. According to WHO, by 1990, 80% of the world's children population were protected by vaccination programmes and the development of vaccines continued and gradually being added to the EPI programmes in many countries. To date, over the course of three centuries, even though millions of infants and children are still deprived of basic

immunization programmes as per WHO, the success of EPI can be acknowledged by witnessing the significant reduction in worldwide cases of vaccine-preventable diseases.

Generally, all countries have their own national immunization programme with the aim to protect the population against vaccine-preventable diseases. The variety of backgrounds of each country project a broad spectrum of immunization programmes' progress (WHO, 1996). Those who are affected by war and conflicts may suffer from poor and low immunization coverage while others with good resources are tiptoeing closer to eliminating certain diseases. In order for the immunization programmes to be successful, it primarily depends on up-to-date policies and its effectiveness to ensure their goals to be achievable and to secure its sustainability (WHO, 2018). This is where health policy analysis comes in place.

This study will be answering the research question of what are the roles of policy analysis in national immunization program policy? Therefore, the aim of this manuscript is to review the role of policy analysis in selected countries regarding national immunization program policy. Policy analysis has been regard as a routine activity at the presence of national level policy that as costly and important as the national immunization program. However, the actual role of policy analysis has never been clearly explained in any literature. We will explore how policy analysis play its part in providing evidence and ground for decision making with regards to national policy at various stage of policy process which include formulation, adoption, implementation and evaluation.

2.0 Approach to Policy Analysis

Policy analysis goal is to describe, evaluate and prescribe. To achieve these, policy analysts must use correct approach to produce information and arguments about three vital elements. First is empirical approach where the policy analysis answer does it and will it exist (facts) that will produce descriptive and predictive information. Second approach is evaluative where we want to know the worth of the policy. Third approach is normative where analysts should be able to prescribe what to be done to the policy (Dunn, 2012). To carry out policy analysis, it is important to understand the body of policy analysis that is made of framework, methods and models or theories.

2.1 Policy triangle framework

The basis of policy is a framework developed by Walt and Gilson in 1994 specifically for health, although its relevance extends beyond this sector. They noted that health policy research focused largely on how actors use their power on the content, context and process of the policy-making. This **Policy Triangle Framework** (Figure 1) is grounded in a political economy perspective, and considers how all four of these elements interact to shape policy-making.
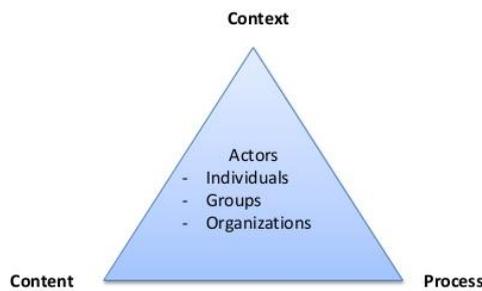
Figure 1. Policy Triangle Framework
Source: Walt and Gilson, 1994

In this review, the focus will be given more towards content and process of the policy as the main discussion is regarding policy analysis which involves processing (process) information (content) into solution.

2.2 Policy analysis framework

Introduced by William N. Dunn in 1981, this framework combines policy informational component that are transformed into one another by using policy analysis methods or steps. This framework is problems centred and from there various types of information is collected and analysed in order to address the policy problem. Information and steps are dependent of each other and although the framework forms as a cycle, the relationship of the components are dynamic.
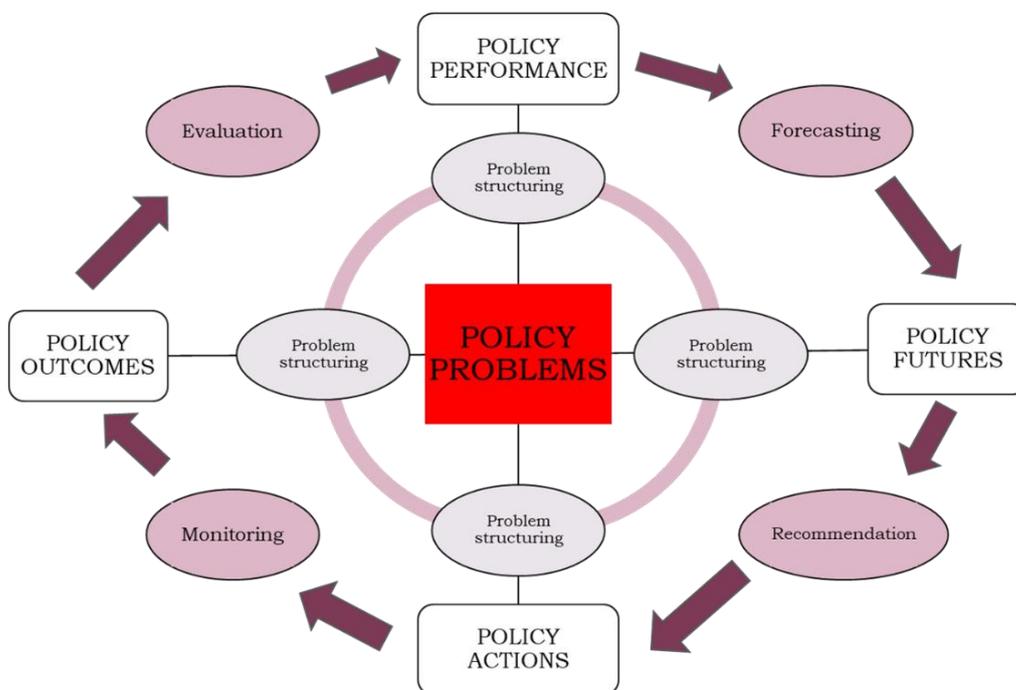

Figure 2. Policy Analysis Framework
Source: William Dunn, 1981

2.3 Methods in policy analysis

Method of policy analysis is the steps taken in carrying out the process of analysis and there are several methods introduced by different authors. William N. Dunn (2012) described policy analysis as aiming to create, critically assess and communicate policy-relevant knowledge within policy making process. Each step is vital as they will affect the subsequent phases. His method (or as he described in his book as procedures) of policy analysis comprises of five steps:
1. problem structuring
2. forecasting
3. recommendation
4. monitoring
5. evaluation

Another method of policy analysis was introduced by Warren E. Walker in 2000. The steps are described as below:
1. Identify the problem
2. Identify the objectives of the new policy
3. Decide on criteria (measure of performance and cost) with which to evaluate alternative policies
4. Select alternative policies to be evaluated
5. Analyse each alternative
6. Compare the alternatives in terms of projected costs and effects
7. Implement the choses alternative
8. Monitor and evaluate the results

According to Walker, the first three steps which also called 'problem formulation steps' are very important to be carried out correctly to find the main and actual problem. The latter steps are called 'problem solving steps' (Walker, 2000). Similar steps are described by Weimer and Vining and named as Steps in the Rationalist Modes. They however felt that both group of steps are as important because clients always look at the outcome (Weimer and Vining, 1992).

Carl V. Patton (1989) also outline a cycle of policy analysis as in Figure 3. He stated that at the third and fourth step while identifying alternative policies and evaluating alternative policy, analysts can always go back to verifying and defining the problem. This is to avoid deciding on false alternative as the solution. After monitoring the implemented policy, there is always issues that needs to be addressed and this will bring the cycle back to the first step.
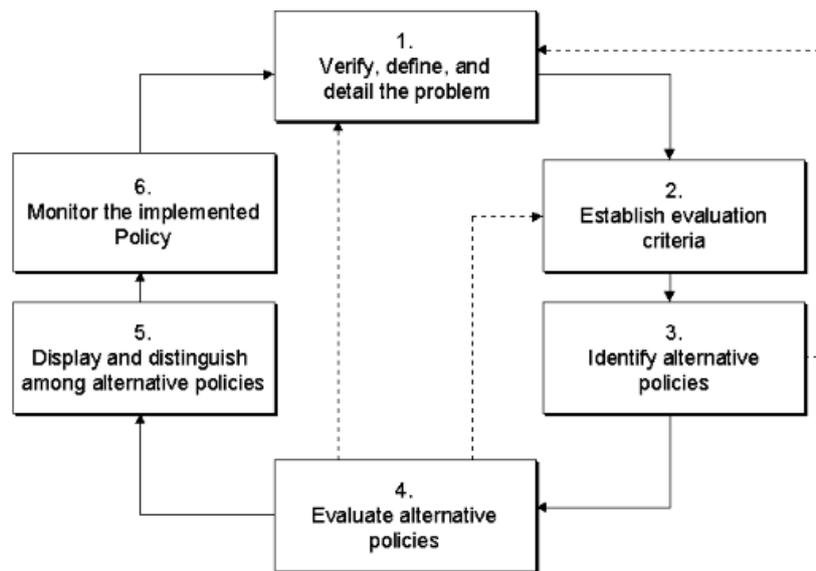
Figure 3. Steps of Policy Analysis
Source: Carl V. Patton, 1989

Looking at all the various methods of policy analysis, it can be concluded that most of the steps taken are mostly similar and have the same purpose. All of the methods consist of identification of problem, providing best alternatives, implement the alternatives and evaluation. It is important to remember that the steps of policy analysis process are not always linear and may need to be repeated.

2.4 Policy analysis theories

There are multiple theories explaining the policy-making process and its impact. There are three currents in approaching policy analysis according to the actors. The first current focus on the state who is in power of the policy-making. This current is divided into three theories. In these theories, policy analysis is viewed as to whom the state is giving attention to. Mény and Thoenig (1989) describe three theories based on this concept:

1. Pluralist approach interpret the state as responsible to answer and respond to the public demand.
2. Neo-marxist approach
3. Neo-corporatist approach

The second current theories focus on the how public authorities works to analyse policies. This current does not see the state as one actor anymore but a group of important organization that influence the policy. There are four types of approaches in this current which are:

1. Public management approach
2. Economic approach
3. Administrative institution approach
4. Cognitive approach

The third current wants to show the impact of the public action either an expected outcome or unwelcomed effect towards many parties. The theories described under these currents are:

1. Methodological approach
2. Process of evaluation approach

Another set of theories were developed based on the process of policy analysis that are worth mentioning to grasp the complexity of policy analysis. All the theories are not exclusive and in most situation, more than one theories could simultaneously occur or used.

- Multiple Streams Framework Theory, described by John Kingdon in 1984 is concerned with agenda setting, argues that the public policy process has a random character, with problems, policies and politics flowing along in independent streams (Walt et al, 2008).
- Punctuated Equilibrium theory (Baumgartner and Jones', 1993) postulates that the policy-making process is characterized by periods of stability with minimal or incremental policy change, disrupted by bursts of rapid transformation.
- Policy Feedback Theory (Schattschnider, 1935) hypothesized that new public policy creates new politics. This theory has been expanded by Pierson in 1993 who explained that enacted public policies have the power to influence the political behaviours of politicians, interest groups and the public through two primary pathways: interpretive effects and resource effects.
- Implementation theories (Sabatier, 1999) have been dominated by a discourse as to whether decision-making is top-down or bottom-up, or a synthesis of the two.
- Advocacy Coalition Framework (Sabatier and Smith, 1980s) was created to provide a shared research platform that enables analysts to work together in describing, explaining, and predicting phenomena in various context.
- Narrative Policy Framework (Jones and McBeth, 2010) is a theory of policy process that is elaborated in narrative strategy and characterized by four core elements; settings (context), character (actors), plot (content) and moral of the story (solution).

3.0 Materials and Methodology

3.1 Sources

We conducted a scoping review using 3 main databases as follows; PubMed, Scopus, Google Scholar. The search exercise was extended through manual research looking at grey literatures, and published international guidelines and relevant government report on national immunization policy.

3.2 Search exercise

The scoping literature search was conducted using the combination of keywords and its related scopes available as follows; "policy analysis" or "policy evaluation" or "policy formulation" or "policy making" and "national immunization program" or "national vaccination program". The search exercise was limited to the full text articles, scholarly journals and English articles that were published for the past 10 years, articles related to policy analysis of national immunization program, how they were carried out, who are involved and what are the outcomes. Two review authors extracted data independently from

each study regarding type of study, published year, journal, the location of study and outcomes of the study. The quality of the reviewed articles was not further assessed as the credit of journals was considered enough.

3.3 Search process

The search flow and process were performed according to the PRISMA guideline as presented in Figure 4. The initial search yielded 404 articles (PubMed 122, Scopus 97, Google Scholar 169 and grey literatures 16). After checking for duplicates, 69 articles were excluded and after reading the abstracts, another 292 articles were excluded. Subsequently, after reading the full texts of the remaining 43 articles, only 12 articles were included in this review.
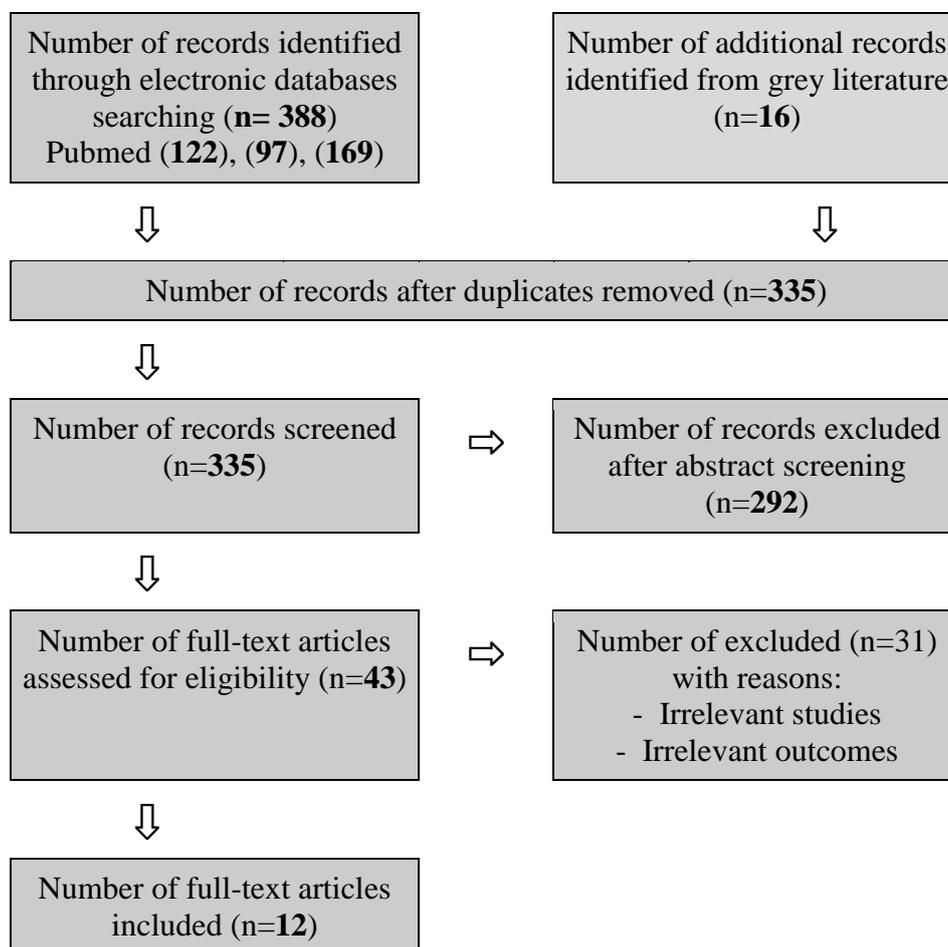

Figure 4: PRISMA Diagram of the Scoping Review

4.0 Results

The following table summarised the list of articles being reviewed in the discussion and how the role of policy analysis being grouped into 5 subheadings.

Table 1. Summary of article reviewed and roles of policy analysis

No.	Author, Year	Title	Country	Major roles of policy analysis
1	American Academy of Pediatrics (1989)	Measles: Reassessment of the Current Immunization Policy.	USA	Evaluating existing policy, prescribe recommendation and modification of policy
2	Hadisoemarto, Reich & Castro (2016)	Introduction of pentavalent vaccine in Indonesia: a policy analysis	Indonesia	Evaluating existing policy, prescribe recommendation and modification of policy
3	Husic, Jatic, Joguncic & Sporisevic (2018)	Evaluation of the Immunization Program in the Federation of Bosnia and Herzegovina - Possible Modalities for Improvement	Bosnia & Herzegovina	Evaluating existing policy, prescribing recommendation and modification of policy
4	Ministry of Health (2016)	Circular Letter: Changes in Measles Immunization schedule for children in Malaysia	Malaysia	Modification of policy, prescribe recommendation and evaluating policy
5	Gurnani et al (2018)	Improving vaccination coverage in Indian: lessons from Intensified Mission Indradhanush, a cross-sectional system strengthening strategy	India	Evaluating existing policy, modification of policy and prescribe recommendation
6	Cho (2012)	An overview of national immunization policy making process: the role of the Korea expert committee on immunization practices	Korea	Formulating new policy and choosing best alternative policy
7	Chunsuttiwat, Biggs, Maynard, Thammapormpilas, & Prasertsawat (2002)	Comparative evaluation of a combined DTP–HB vaccine in the EPI in Chiangrai Province, Thailand	Thailand	Evaluating existing policy, formulating new policy and modification of policy
8	Salisbury (2005)	Development of Immunization Policy and Its Implementation in The United Kingdom	United Kingdom	Formulating new policy and choosing best alternative policy
9	Marylin (2017)	Policy analysis: Improving vaccination rates among school aged children	Canada	Evaluating existing policy, choosing best alternatives policy and prescribing recommendations
10	Matkin et al. (2014)	Canadian communicable disease report: measles containing vaccination rates in Southern Alberta	Canada	Evaluating existing policy, choosing best alternatives policy and

IJPHCS
Open Access: e-Journal

International Journal of Public Health and Clinical Sciences
e-ISSN : 2289-7577. Vol. 6:No. 5
September/October 2019

				prescribing recommendations
11	Miller & McCann (2000)	Policy analysis of the use of hepatitis B, Haemophilus influenza type-b, Streptococcus pneumoniae-conjugate and rotavirus vaccines in national immunization schedules	WHO	Evaluating policy, prescribing recommendation and modification of policy
12	Program for Appropriate Technology in Health (PATH) (2016)	Immunization in the Democratic Republic of the Congo Landscape Analysis and Policy Recommendations.	Democratic Republic of Congo	Evaluating existing policy and prescribing recommendation

4.1 Role of policy Analysis

Immunization program has been proven to be the most successful public health practice to significantly reduce death and burden from vaccine preventable diseases among children around the world. However, there are still concerns regarding its ability to achieve full potential to curb the outbreak and eliminate the diseases completely. Taking for an example, measles immunization has been established in the WHO Expanded Program on Immunization since 1966. This policy has been adopted by many countries since 1966 but they are still far from meeting the Global Vaccine Action Plan on measles elimination target. Centre of Disease Control US reported that as in February 2019, total number of outbreaks in US has surpassed the annual 2016 and 2017 number of outbreaks. This might imply some underlying issues with regards to the national immunization policy either from the formulation and development of the policy, implementation or evaluation of the policy.

Policy analysis plays an important role to examine these issues closely. There are various policy analysis review using many types of approach and frameworks to examine national or specific vaccine preventable diseases immunization policy in the literature. These analysis focuses on the actors, context of the policy and content of the immunization policy itself.

4.1.1 Evaluating existing policy

Policy analysis is important component in evaluating the existing policy. The key point to successful national immunization program is up-to-date policies and effective strategies of implementation to achieve and sustain the target of the program (WHO, 2019). Therefore, it is important for a country to continuously evaluate their existing policy to cater for the demanding and changing needs of immunization. By doing this, strength and weaknesses of a particular policy can be highlighted, and appropriate measures can be taken immediately. Furthermore, the assessment of the policy helps to provide understanding and detail insight on certain failure of the policy.

Policy analysis plays it role by providing a systematic and structured framework to examine the policy in detail. For example, the content of the policy will be scrutinized, and the performance of the stakeholders will be examined to determine whether the policy able to achieve its objective. American Academy of Pediatrics, by its special committee on infectious diseases (1989) did a reassessment of the existing measles immunization policy in 1989

following a massive outbreak of measles in their country. The committee concluded that the existing policy content were not able to prevent majority of the outbreaks as the outbreak occurred in schools with high immunization coverage 96% or more, and low attack rates of 1% to 5%. However, majority of the measles case occurred among unvaccinated children who are not yet eligible for immunization as they are younger than recommended age for immunization according to the existing policy. The assessment also looked at the all the stakeholders and actors involved in the outbreak and they found that the schools, college and institution involved does not have documentation of student's immunizations status prior to entry. Therefore, the recommendation was to review recommended age for immunization policy, and to make immunization documentation prior to school entry compulsory to prevent further outbreaks.

A policy analysis on pentavalent vaccines in Indonesia was conducted in 2016 to help other policymakers and stakeholders on the understanding of process that may hasten introduction of immunization policy in the country. The methods use was process tracing and case comparison using qualitative data and pro-forma. From this information, they identified four major inter-linked process that were pertinent to the policy introduction which were vaccine use policy process, financing process, domestic vaccine development process and political process (Hadisoemarto, Reich & Castro, 2016). As evidence by this policy analysis, not only it able to identify gap and provide recommendation but policy analysis also play its role to provide insights on good practice and better understanding of existing policy.

UNICEF together with WHO carried out a policy analysis evaluating the national immunization program in Bosnia and Herzegovina (B&H). A team consist of experts of immunization epidemiology and health system planning is formed to undergo the process of preparation, data collection, analysis, developing recommendations, and reporting. The assessment will look into three components; immunization operations, the health system and external environment (UNICEF and WHO, 2000). From the national vaccination data, it is found that the country's program coverage is not adequate. From the analysis, they saw a tendency for low vaccination of all routine vaccines in 2012-2016, especially Tuzla, Sarajevo and Central-Bosnia Cantons. B&H are considered the area of endemic transmission of measles, and it is the country of risk for import of polyomyelitis as a result of low local, regional and national vaccination for MMR and polio vaccine. This is most likely contributed by improper immunization record implementation as there is no individualized immunization book. This caused difficulty in surveillance and patient empowerment in vaccination catch up. This analysis however, does not mention cost-analysis in their review (Husic, Jatic, Joguncic and Sporicefic, 2018).

4.1.2 Modification of policy

Apart from evaluating existing policy, policy analysis also plays it role in providing evidence-based recommendation to modify and improve existing policy. Moving towards evidence-based public health practice, any proposed changes to the existing policy will be supported by evidence and this is how policy analysis plays it role.

Malaysia National Immunization Program has been established since the year 1963 and measles vaccination was introduced in 1982 to infant age nine months old. In 2004, the first adjustment to the national immunization schedule was made to allow two doses of measles

vaccine to be given at one-year-old and seven years old, based on recommendation paper from WHO. Since then, all the vaccine preventable diseases including measles were being monitored closely through established surveillance system in the country. The surveillance of measles case in the country was reported to be increasing from 2011 to 2015. Further investigation on the cases found that majority of measles cases were not eligible for vaccination as they age between 9 to 11 months old. Therefore, the National Committee on Immunization Policy and Practice has conducted a policy analysis to review the existing policy and come out with possible solutions. One position paper published by WHO outlining different age recommendation for measles vaccination based on the endemic status of a particular country was reviewed (WHO, 2009). The committee also exploring the feasibility of the policy changes from the primary health care deliveries perspective in term of staff readiness, vaccine availability and patient's acceptability. The outcome of the analysis was to modify the policy of measles vaccination age to nine and twelve months, and this was enforced in 2016. This shows that policy analysis is important in providing evidence to guide decision making and modifying the policy.

In India, the Ministry of Health and Family Welfare has conducted a policy analysis on their national childhood immunization program following a slow rise of the vaccination coverage to achieve target (Gurnani et. al, 2018). They scrutinised the existing policy in detail from various aspect and focusing more on the stakeholders involved in the implementation process. All the barriers to vaccination was acknowledged and the recommendation given was to modify the policy to cater for the weakness identified. The new modified policy engaged stakeholders outside the health sector to improve the participation and support of the vaccination program. This will enable them to have sustainable high level of support from the political figures to advocate, allocation of human resources and funding to the vaccination program in the country. This study illustrates the role of policy analysis in modifying policy to lead to a better outcome.

4.1.3 Formulating new policy

New immunization policy development will require policy analysis to be conducted prior to introduction and implementation. Literature has shown that the key to improve and sustain immunization program and new vaccine and technologies are to ensure that there are clear process of decision making supported by evidence to enable informed decision making (Duclos, 2010).

Currently, majority of the countries have established a special technical advisory committee to guide immunization policy at national level. To name a few, United States has the Advisory Committee in Immunization Practice established in 1964 by US Surgeon General while United Kingdom have the Joint Committee on Vaccination and Immunization established in 1963 and Ministry of Health and Welfare in Korea has established the Korea Advisory Committee on Immunization Practices in June 1992 (Cho, 2012). WHO has acknowledged these advisory bodies as a National Immunization Technical Advisory Groups (NITAGs) and strongly recommends via Global Vaccine Action Plan 2012 for all country to establish these advisory bodies in their respective country. The main task of this group will be conducting policy analysis and determine the optimal national immunization policies.

The role of policy analysis is very clear in formulating new immunization policy as it provides technical input on the evidence and guide policymaker to make decision. Policy analysis in the policy formulation phase is very comprehensive as it will cover all the important content and context, as well as the actors involved. It also explores the politics, power and process as these are the main determinant of success for policy implementation later.

In Thailand, Hepatitis B vaccine was included in the national immunisation schedule in 1992 following a successful pilot project which provides evidence that Hepatitis B vaccine able to reduce chronic Hepatitis B carrier in children below 5 years old by 80% (Chunsuttiwat, Biggs, Maynard, Thammapormpilas, & Prasertsawat, 2002).

In the United Kingdom, the Department of Health (DH) London coordinate the development of the national immunization policy involving many organizations. The Joint Committee on Vaccination and Immunisation is the statutory expert committee that consist of members of various disciplines with regards to immunization that function as advisory unit with no executive role. JCVI also includes members from Communicable Disease Surveillance Centre (CDSC) of the Health Protection Agency (HPA) and the National Institute for Biological Standards and Control (NIBSC). The JCVI will review the researches and cost-benefit analysis done by HPA, while the Immunization Unit under Department of Health needs to develop the immunization policy statement and implementation strategy. This policy was developed for England, Wales, Northern Ireland and Scotland, which underwent adaptation for local implementation by each country's government health departments (Salisbury, 2005).

4.1.4 Choosing best alternatives policy

In the process of policy analysis, alternatives generation is one of the crucial steps. Several alternatives are highlighted and being proposed to be considered in developing good recommendation at the end of the analysis. Since generating policy alternatives alone is not adequate in formulating recommendation, all alternatives must then be explored and evaluated so that the objective and the problem identified at the beginning of the policy analysis are adequately addressed. Subsequently, these alternatives will be compared to assess the advantages and disadvantages of the policy options. This will help the process of choosing best alternatives once a comparison of all alternatives is done. The process is so elegant that it guides the policy makers step by step in playing a role of choosing the best alternatives policy.

A policy analysis on improving vaccinations rates among school aged children in Alberta, Canada (Marylin, 2017) is a good example on emphasizing this particular role of policy analysis. The analysis was done to provide a series of policy options and recommendation to address the issue of decreasing vaccination rates in school aged children across Alberta. It yielded three policy options to be considered which are (1) dissemination of information, exhortation and individual behaviour through social media, (2) provincial taxation; where the government of Alberta initiate a tax incentive for families who are able to provide the necessary documentation as a proof that their children have been vaccinated against all listed diseases and (3) authority; where vaccination will be made mandatory for students to attend publicly funded schools in Alberta. In order to evaluate and analyse all the alternatives, an evaluative criterion was set comprised of effectiveness, efficiency, consistency and legal

requirement. The projected outcome showed that restrictive policy such as mandatory vaccination combined with incentives given to those who being vaccinated are more preferable policy and has yielded vaccination rates ranged 93.6-99.7% in United States (CDC, 2014) as compared to Alberta which are estimated at 87.5% (Matkin et al., 2014).

4.1.5 Prescribing recommendations

Policy analysis is a tool to prescribe solution to a national issue or agenda. As explained by William Dunn (2012), policy analysis should be able to describe and evaluate the policy and most importantly prescribe recommendation to improve the current policy. WHO provide a universal policy analysis on whether to include hepatitis B (HB), haemophilus influenza type B (Hib), streptococcus pneumonia (SP) conjugate and rotavirus vaccine into national immunization programs. The study used models to estimate the disease burden, financial requirements for implementation, estimated disease burden reduction and cost-effectiveness from the incorporation of the vaccines into national vaccination programmes according to each country status. The model includes outcomes; total vaccine and administration costs; the expected annual deaths, with and without the specific vaccine; and the cost per life saved and life-year saved. The example of this model is shown in Table 2.

Table 2. Aggregate results of countries that are currently using Hb vaccine

Carriage prevalence	Income group	1996 Surviving infants (millions)	Estimated annual deaths (thousands) Low	High	Predicted annual years life lost (millions) Low	High	Estimated deaths prevented (thousands) Low	High	Years of life saved (millions) Low	High	Vaccine programme cost (USD millions)	Cost per life-year saved (no treatment savings) (USD) Low	High
≤2%	Low	0	0	0	0.0	0.0	0	0	0.0	0.0	0.3	42	59
	Lower-middle	1	2	2	0.0	0.1	1	2	0.0	0.1	2.0	37	52
	Upper-middle	4	6	8	0.2	0.3	5	7	0.2	0.2	22.8	103	144
	High	1	0	0	0.0	0.0	0	0	0.0	0.0	40.1	17 815	24 942
≤2% Total		6	8	11	0.2	0.3	7	9	0.2	0.3	65.3	228	320
>2–<8%	Low	11	187	262	4.5	6.3	140	196	3.4	4.8	65.9	14	19
	Lower-middle	3	12	17	0.3	0.4	10	14	0.2	0.3	4.9	15	21
	Upper-middle	3	15	22	0.4	0.6	11	16	0.3	0.4	10.5	24	33
	High	1	0	0	0.0	0.0	0	0	0.0	0.0	59.4	3974	5564
>2–<8% Total		42	215	301	5.2	7.3	162	227	4.0	5.5	140.7	25	36
≥8%	Low	25	417	584	5.2	7.3	248	347	3.3	4.6	36.6	8	11
	Lower-middle	3	45	63	0.6	0.9	26	37	0.4	0.5	3.6	7	9
	Upper-middle	0	1	2	0.0	0.0	1	2	0.0	0.0	0.5	17	24
≥8% Total		28	464	649	5.9	8.2	275	385	3.7	5.2	40.7	8	11
Total		76	686	961	11.3	15.9	444	621	7.9	11.0	246.7	22	31

[a] Results are stratified by carriage prevalence and income group.

The policy analysis concluded that HB and Hib vaccines should be considered to be integrated to all national immunization programmes. SP and rotavirus vaccines, with the given assumptions, would also be cost-effective. Proactive analysis of the economic and epidemiologic impact of these vaccines can hasten their introduction into national vaccination schedules (Miller and McCann, 2000).

In a low income country such as Democratic Republic of Congo (DRC), a policy analysis on the national immunization program could help the country to improve source of funding on vaccines. PATH undertaken an analysis that includes policy reviews as well as interviews with stakeholders and decision-makers who govern immunization in the DRC. The report

examines the main immunization challenges related to vaccine management and delivery and delays in domestic financing commitments. This analysis recommends health department of DRC to enact a legislation that mandates domestic financing for immunization as a required expenditure in the national budget (Program for Appropriate Technology in Health (PATH), 2016).

Not all recommendation from policy analysis should be adopted into action. However, the weight of these suggestions is seriously appreciated by the actors as they are evidence based interpretation that underwent thorough critical process.

5.0 Discussion

From our literature and article review, we identified a variety of roles of policy analysis in national immunisation program, of which later we classified them into five major roles of policy analysis which are (1) evaluating of existing policy, (2) modification of existing policy, (3) choosing best alternative policy, (4) formulating new policy and (5) prescribing recommendation. The role of doing policy analysis are often being limited to just one particular purpose without taking into consideration of other roles that it plays along while analysing the policy. The significance of identifying the role in policy analysis so that we have a wider and better understanding on how these roles influence the policy towards achieving its efficiency and effectiveness. The existence of a policy is justified by the reason of why it is established in the first place. However, since flaws may be present along the way during the policy making process or even during implementation, the existence of policy analysis is justified by the role it carries to improve the policy itself. From the major roles of policy analysis obtained in this study, it can be deduced that policy analysis has an ability to determine whether or not such policy is effective or efficient by an attempt to dissect policy and obtain all information required in order to draw such conclusion. The recommendations that follows will help to guide in improving and constructing better policy.

In a real-world situation, one or more roles of policy analysis are involved along the process of making the analysis and sometimes not all at the same time. However, the more the combination of role, the better the analysis and more comprehensive it becomes. Hence, we decided to come out with a diagram illustrating the relationship and a possible combination of these five major roles in policy analysis. The representation of combination of these roles in policy analysis is illustrated in Figure 5 below.
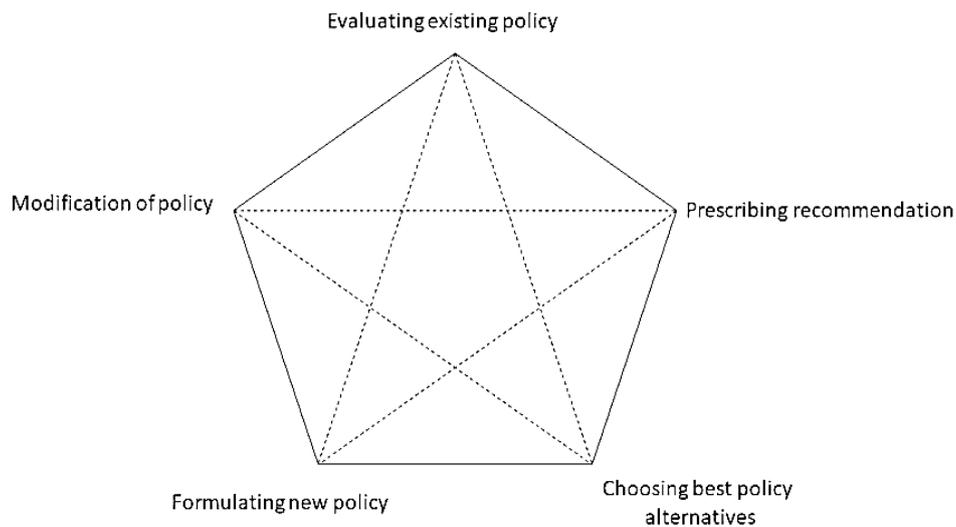
Figure 5. Major Roles of Policy Analysis

The reason we conduct this study is to reveal how policy analysis ensures the effectiveness and the efficiency of a national immunisation policy by the roles we have listed above. For example, its role on choosing best alternative policy helps in determining the advantages and disadvantages of all policy alternatives which are listed during the process of policy analysis. By comparing and contrasting all alternatives provided, policy-makers will be able to make the best choice out of these alternatives that they think might suit their current needs and resources in overcoming problem stated early in the process of making policy analysis. However, the onus is on any government ensuring those roles of policy analysis so that immunisation policy is implemented as effectively as possible, to be able to continuously adapt to an environmental change, to continuously fulfil the demands, needs and expectation of stakeholders as well as remaining within the guidelines of the authorities in various agencies of government (Meiring, n.d).

The limitation of our review is the role of policy analyses relating to national immunization program is being described in broad and general term rather than being focus on particular framework. The selected countries reviewed were based on the availability on the literature rather than grouping it into developing or developed countries. There was limited information obtained from the literature on the detail steps of policy analysis conducted. We acknowledged that the role of policy analyses might vary in different setting like low income countries, different demographic profile and maturity of the national immunization program in the country. Therefore, our review offers general overview on how policy analysis plays its role in national immunization program and further study are needed to explore in details each role in specific settings.

6.0 Conclusion

The roles of policy analysis act as a concrete platform in developing new policy and evaluating the effectiveness and efficiency of the existing immunization policy. Policy-

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makers should make themselves aware of these roles while performing an analysis as it could help them along the process of analysing policy. Despite the simplicity of the framework of policy analysis, health policy analysis is indeed a tedious endeavour. By having a clear picture of what role it plays in making policy analysis, perhaps the process can be less daunting to ensure the effectiveness and efficiency of immunization policy.

Acknowledgement

Declaration

No conflict of interest.

Authors contribution

Author 1:................................, Author 2:.............................,Author 3:...................................

Author 4:.................................and Author 5:..

References

American Academics of Pediatrics (1989) Measles: Reassessment of the Current Immunization Policy. Pediatrics. 84(6):1110-1113

Centre for Disease Control. (2014). Vaccination coverage among children in kindergarten-United States, 2013-2014 school year. Morbidity and mortality weekly report, 63(41), 913-920. Retrieved from: https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6341a1.htm

Cho, H.Y (2012) An overview of national immunization policy making process: the role of the Korea expert committee on immunization practices. Korean J Pediatr. 55(1):1-5

Chunsuttiwat, S., Biggs, B., Maynard, J., Thammaporppilas, P., & O-Prasertsawat, M. (2002) Comparative evaluation of a combined DTP–HB vaccine in the EPI in Chiangrai Province, Thailand. Vaccine 21. 188-193

Collin T. (2004). Health policy analysis: a simple tool for policy makers. Public Health (2005) 119, 192–196

Duclos, P. (2010) National Immunization Technical Advisory Groups (NITAGs): Guidance for their establishment and strengthening. Vaccine 28S A18-A25.

Dunn, W. N. (1981). Public Policy Analysis. Englewood Cliffs, NJ: Prentice-Hall

Gilson L, Orgill M, Shroff ZC. (2018). A health policy analysis reader: the politics of policy change in low- and middle-income countries. Geneva: World Health Organization

Gurnani et al (2018). Improving vaccination coverage in Indian: lessons from Intensified Mission Indradhanush, a cross-sectional system strengthening strategy. BMJ. DOI: https://doi.org/10.1136/bmj.k4782

Hadisoemarto, P., Reich, M. & Castro, M. (2016) Introduction of pentavalent vaccine in Indonesia: a policy analysis. Health Policy and Planning, 31(8):1079-1088

Health Policy Project. (2014). "Capacity Development Resource Guide: Policy Analysis." Washington, DC: Futures Group, Health Policy Project. Retrieved from Retrieved from https://www.healthpolicyproject.com/pubs/272_PolicyAnalysis.pdf

Husic, Jatic, Joguncic & Sporisevic (2018). Evaluation of the Immunization Program in the Federation of Bosnia and Herzegovina - Possible Modalities for Improvement. Mater Sociomed. DOI: 10.5455/msm.2018.30.70-75

Kent Buse, Nicolas Mays & Gill Walt. (2012). Making Health Policy. Open University Press: UK

Knoepfel, Larrue, Varone and Hill (2011). Theoretical perspectives on policy analysis. Chapter 1. The Theoretical Framework. Public policy analysis, pp.3-14. DOI: 10.1332/policypress/9781861349071.003.0001

Marylin Bergstra. (2017). Policy Analysis Improving Vaccinations Rates Among School Aged Children. Retrieved from https://marilynbergstra.files.wordpress.com/2017/06/policy-analysis-increasing-child-vaccination-rates.pdf

Matkin, A., Simmonds, K., Suttorp, V. (2014). Canadian communicable disease report: measles containing vaccination rates in Southern Alberta. The Public Health Agency of Canada. 40(12). Retrieved from: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/14vol40/drrm40-12/dr-rm40-12-surv-2-eng.php

Meiring, M. H. (n.d.). The nature and importance of policy analysis and evaluation in the local sphere of government. Pretoria: Kagiso

Miller, M. A., & McCann, L. (2000). Policy analysis of the use of hepatitis B, Haemophilus influenzae type b-, Streptococcus pneumoniae-conjugate and rotavirus vaccines in national immunization schedules. Health Economics, 9(1), 19–35. doi:10.1002/(sici)1099-1050(200001)9:1<19::aid-hec487>3.0.co;2-c

Ministry of Health Malaysia (2016) Circular Letter: Changes in Measles Immunization schedule for children in Malaysia. Putrajaya, Malaysia.

Program for Appropriate Technology in Health (PATH) (2016). Immunization in the Democratic Republic of the Congo Landscape Analysis and Policy Recommendations. Retrieved from: https://path.azureedge.net/media/documents/APP_drc_landscape_rpt.pdf

Paul S, Steedman D and Sutton F. (1989). Building capability for policy analysis. Policy, Planning and Research Working Papers. World Bank, Washington, DC. Retrieved from https://core.ac.uk/download/pdf/6373582.pdf

Salisbury D. M (2005). Development of Immunization Policy and Its Implementation in The United Kingdom. Health Affairs: Volume 24 Number 3; page 744-754. DOI: 10.1377/hlthaff.24.3.744

United Nation International Children's Emergency Fund (UNICEF) & World Health Organization (WHO) (2000). External Evaluation of the National Immunisation Programme in Bosnia and Herzegovina. UNICEF. Retrieved from: https://www.unicef.org/evaldatabase/files/BHG_2000_010.pdf

Walt G and Gilson L (1994) Reforming the health sector in developing countries: the central role of policy analysis. Health Policy and Planning 9: 353–70.

World Health Organization (WHO). (1996). Immunization Policy. Retrieved from http://whqlibdoc.who.int/hq/1995/WHO_EPI_GEN_95.03_Rev.1.pdf

World Health Organization (WHO). (2017). WHO Position Paper on Vaccines against measles virus April 2017. Weekly epidemiological record. 92(17):205–228

World Health Organization (WHO). (2018). Immunization Policy and Strategies. Retrieved from https://www.who.int/immunization/programmes_systems/policies_strategies/en/

World Health Organization (WHO). (2019). History of Vaccine Development. Retrieved from https://vaccine-safety-training.org/history-of-vaccine-development.html