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Vaccine decision-making in Afghanistan: stakeholder analysis and evidence synthesis of policies and processes during 2010-2021

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Abstract

Introduction

Vaccine policy decisions have substantial health, equity, and cost implications for resource-constrained countries. This study aimed to examine how vaccine decisions were made in Afghanistan between 2010 and the regime change in 2021, focusing on the processes, evidence, and actors that shaped national immunisation policy during this period.

Methods

We reviewed Afghanistan's vaccine-policy architecture, vaccine adoption decision-making processes, and stakeholder dynamics between 1 January 2010 and 31 July 2021. We reviewed national guidelines, frameworks, meeting minutes, and other grey literature, and conducted semi-structured interviews with 18 immunisation experts representing government, non-governmental organizations, donors, and advisory bodies. The information from the semi-structured interviews was analysed thematically. A stakeholder network map was developed to illustrate the level of influence, interest and interaction among actors.

Results

Document review and stakeholder interviews identified major immunisation policy developments in Afghanistan, including the introduction of PCV13 (2013), hepatitis B birth dose (2014), IPV (2015), and rotavirus vaccine (2018), alongside schedule revisions. Three formal platforms, the EPI Taskforce, Interagency Coordination Committee (ICC), and the National Immunization Technical Advisory Group (NITAG), served as core decision-making bodies with distinct but interlinked mandates. Network analysis positioned the Ministry of Public Health (MoPH) at the centre of governance, though WHO, UNICEF, and Gavi exerted comparable influence.

Four cross-cutting themes emerged: (1) declining NITAG functionality due to limited technical capacity, governance weaknesses, and communication barriers; (2) strong external influence, with policy timing often aligned to Gavi funding windows; (3) absence of structured evidence appraisal processes, resulting in reliance on WHO recommendations and operational feasibility; and (4) hierarchical culture, gender imbalance, and occasional partner-driven agenda setting that shape deliberations and outcomes.

Conclusion

Strengthening Afghanistan's vaccine policy process will require programmatic, incremental reforms within current political and financial constraints. Feasible steps include targeted capacity-building for NITAG members, adoption of simplified evidence appraisal tools adopted to local context, and improved documentation to enhance transparency and consistency.

Introduction

Since the Expanded Programme on Immunisation (EPI) was launched in 1974, vaccines have averted an estimated 150 million deaths globally [1]. Newer products are more expensive than the traditional vaccines used to prevent measles, diphtheria, pertussis, tetanus and tuberculosis [2] and low- and middle-income countries (LMICs) face difficult trade-offs when deciding whether to introduce, switch, reschedule, or discontinue vaccines [3–5].

Policy guidance is channelled through a tiered advisory system: WHO's Strategic Advisory Group of Experts (SAGE) at the global level, Regional Immunisation Technical Advisory Groups (RITAGs) at the regional level, and National Immunisation Technical Advisory Groups (NITAGs) at the country level [6–7]. At the country level, the composition, resources, and influence of NITAGs varies widely, and the social, political, and donor pressures frequently shape vaccine policy decisions at the country level [8]. If the criteria and boundaries of the decision are unknown or unclear, recommendations may be sub-optimal [8]. Since 2000, several theoretical models and frameworks have been developed to help decision-makers consider the impact and trade-offs associated with introducing or investing in new health interventions, including vaccines [9–10]. However, most were devised in high-income settings. While some LMICs have established guidelines on how they should appraise interventions, most do not have a formal institution for this i.e. a Health Technology Assessment (HTA) agency.

The establishment of Gavi, the Vaccine Alliance in 2000 and its financial support for new vaccine introductions in LMICs, has had an important influence on vaccine decision-making in low-resource countries [11–12]. In these settings, it is particularly important to understand the long-term financial sustainability of vaccine policy decisions, as they can have a substantial impact on constrained health budgets. In Afghanistan, efforts to vaccinate children and the wider population take place within a challenging context marked by substantial reliance on external donors, limited health system capacity, and ongoing security concerns. Afghanistan does not have a formal HTA agency, and the process for vaccine decision-making remains undefined.

This study aimed to understand the process and evidence that guided vaccine decision-making in Afghanistan during 2010–2021 (before the regime change in August 2021), including an assessment of the key actors and their interactions.

Methods

Study design

We reviewed Afghanistan's vaccine-policy architecture, vaccine adoption decision-making processes, and stakeholder dynamics during the period 1st January 2010 to 31st July 2021. This included a document review and semi-structured interviews. The information from the semi-structured interviews was used for stakeholder mapping and network analysis.

Document review

We reviewed programme documents (terms of reference of the various decision-making committees, and other publicly available reports, policies, and strategic plans) and meeting minutes (NITAG, the Interagency Coordinating Committee/Health System Strengthening (ICC/HSS), EPI Taskforce) published between 1 January 2010 and 31 December 2021. We reviewed data in both digital and paper formats. We also carried out a google search (with search terms “Vaccines” OR “vaccine” OR “Vaccination” OR “immunization” OR “immunisation programme” AND “Policymaking” OR “health policy” OR “decision making” OR “Organisational” AND “planning” OR “health plan implementation” OR “adaptation” OR “introduction” OR “priority” OR “new programme”) and reviewed relevant websites during 1st April, 2021 and 31st July 2021. This included a review of the documents and web pages published by the Ministry of Public Health (MoPH), WHO, UNICEF, Gavi, and other technical partners. This process aimed to map information flows, identify key stakeholders, and examine the mechanisms used to interpret and apply evidence in vaccine policymaking. Insights from this review informed the development of the semi-structured interview guide and provided baseline information on Afghanistan’s vaccine-policy landscape. The review also aimed to document the introduction of new vaccines in the country, and map the decision-making processes and actors involved.

Semi-structured interviews

Semi-structured interviews were conducted with 18 participants between 30th June 2021 and 30th March 2022. We explored participants’ perspectives on the vaccine adoption decision-making process, decision criteria, sources of evidence, stakeholder relationships, and suggestions for improvement. Interviews were analysed using thematic content analysis. To inform the stakeholder network map [13], the participants were asked if they had shared information or interacted with other stakeholders over the past year, and if so, the number of contacts and the substance of the contact. They were also asked about their attitude towards other stakeholders i.e. whether they viewed the relationship as positive, neutral or negative. The topic guide is included in the supplementary appendix 1.

Sampling and participants

A list of potential participants was compiled from attendance sheets attached to the minutes of the NITAG and interagency coordination committee for strengthening health system (ICC) /HSS. Eligible interviewees were immunisation experts active in Afghanistan between 2010 and 2021, representing one of four constituencies: government, service-delivery NGOs, international/donor agencies, or advisory bodies (EPI Taskforce, ICC, or NITAG). Purposive sampling identified 26 individuals, of whom 18 (70%) agreed to take part in the study (coded R1–R18).

Data collection

Interviews were conducted in two phases: June 30–July 18, 2021, and January 15–March 30, 2022, with an interruption due to the regime change in August 2021 in Afghanistan. Four interviews were conducted

face-to-face and 14 via Zoom or Skype. The average interview lasted 52 minutes (range: 15–108 minutes).

All participants provided informed consent before the interview. Identifying details were excluded from transcripts, and consent forms were securely stored. Audio files and personal data were kept on an encrypted computer accessible only to the researcher and destroyed within 10 days of transcription.

Thematic content analysis

Interviews were audio-recorded, transcribed, and analysed using thematic content analysis. Verbatim transcripts of interviews were translated into English if conducted in Dari or Pashto, the two national languages. Deductive codes (aligned with the topic guide) and inductive codes (emerging from the data) were applied to identify themes and subthemes [14–16]. Results, including anonymised quotes, were synthesised with findings from the document review. Summaries of key themes are presented in Table S2.

Stakeholder analysis and network map

The stakeholder analysis was conducted using data obtained from the semi-structured interviews. The approach followed the methodology of Balane et al. [13], which offers a structured way to assess stakeholder knowledge, interest, and power in relation to policy implementation. This framework has been increasingly applied in global health policy and implementation research, including analyses of vaccine introduction, health equity, and maternal health policy in LMICs [17–19]. For instance, a stakeholder analysis of community-led collaboration to reduce health inequity in South Korea [17] and subsequently adapted in analyses of maternal health policy in Malawi [18] and immunisation policy in Ghana [19].

In our study, we adapted this framework to capture the perspectives of key informants from national and partner institutions. We scored each respondent's knowledge, interest, and power (each scored 0–3), as well as their position (scored 0–4) in relation to vaccine decision-making (**Table S3**). Interest was defined as the sum of all scores for interest and position i.e. level of support for vaccine policy decision making. Our analysis covered a decade in which a range of vaccine policy questions were considered; our scores should therefore be considered broad representations of knowledge, interest, power, and position, rather than specific to any particular vaccine policy.

Information on the frequency of communication between stakeholders, gathered during interviews, was used to construct the network map. The map combined data from the interview participants (on relationships and frequency of contact) and from the scores assigned to each stakeholder by the interviewer and lead author, using the Balane et al framework [13]. In the network map, influence was defined as the sum of all scores for the knowledge and power categories while the thickness of the connecting arrows reflected the total number of contacts between stakeholders in the past year.

Results

Table S1 summarises the key programme documents, meeting minutes and websites reviewed for content relevant to the period 1st April and 31st July 2021. **Figure S1** illustrates the recruitment and inclusion process for the semi-structured interviews with key informants, while **Table 1** summarises the demographic and professional characteristics of participants. A total of 18 individuals participated in the study, representing diverse institutional affiliations, including MoPH, NITAG, development partners, and the Ministry of Finance (MoF). Most participants were national experts (78%), and the majority were male (83%), with experience in immunisation decision-making ranging from less than five years to more than a decade. Four interviews were conducted in person, and the remainder were virtual, reflecting both geographic dispersion and COVID-19–related restrictions during the data collection period. **Figure 3** shows the network analysis with10 actors linked by 22 information pathways and represents the broad knowledge, interest, power, and position of stakeholders involved in vaccine policy during 2010-2021.

The following sections describe the results and themes that emerged from the document review, interviews, and stakeholder network analysis.

Table 1 *Summary of vaccine policies and infrastructure (2010-2021)*

Based on the document review, Afghanistan's Expanded Programme on Immunisation (EPI) experienced notable policy and programme shifts between 2013 and 2021, within the broader trajectory of immunisation developments since 1978 (**Figure 1**). The review period captured the introduction of PCV13 in 2013, the hepatitis B birth dose in 2014, inactivated polio vaccine (IPV) in 2015, and the rotavirus vaccine in 2018. These introductions were accompanied by schedule adjustments, including the 2016 switch from trivalent to bivalent OPV, the change to four-dose IPV vials in 2017, and the 2021 adoption of a two-dose fractional IPV regimen.

Figure 1

The national document review confirmed that there were three formal platforms that were involved in vaccine decision-making, namely the EPI Taskforce, ICC, and NITAG.Based on document review and interview data, we schematically mapped the composition, functions, and interlinkages among the three decision-making platforms, EPI Taskforce, ICC, and NITAG, to illustrate how technical deliberations are translated into policy recommendations and endorsed at national level **(Figure 2**).

The EPI Taskforce has served as the primary technical forum for discussing immunisation priorities, setting the operational agenda, and coordinating implementation, including initiating discussion on the introduction of new vaccines. Originally it comprised the EPI national management team and its main technical partners, WHO and UNICEF, also known as *"EPI traditional partners"*. Over time, the composition of the Taskforce expanded in response to evolving programmes and efforts to improve access. In late 2019, humanitarian organizations like International Federation of Red Cross (IFRC) and Afghan Red Crescent Society (ARCS) joined the Taskforce. Acasus, a consultancy firm commissioned by Gavi, also

joined the Taskforce in 2019. Acasus supported the real-time monitoring and improvement of EPI data quality. A representative from NGOs providing healthcare services also attended. The EPI Taskforce had approved Terms of Reference (TOR) and met monthly or as needed. Until 2010, recommendations to inform vaccine policies were made by the EPI and its technical partners, WHO and UNICEF, without the involvement of external experts.

Established in 2003 with Gavi support, the ICC served as Afghanistan's high-level forum for immunisation policy and resource allocation. Chaired by the Minister or Deputy Minister of health, it met quarterly (or ad hoc) to approve the EPI comprehensive multi-year plan (cMYP), authorise new vaccine introductions, and oversee Gavi-funded health system strengthening (HSS) and immunisation grants. Voting members included senior MoPH officials, service-delivery NGOs, WHO, UNICEF, and major donors (World Bank, USAID, EU, Canada) [20]. A representative from the Ministry of Finance also attended as a non-voting observer.

In 2010, the Health Minister endorsed the creation of the Afghanistan NITAG, consisting of 10-15 members nominated by the Minister of Public Health. The members were divided into core (voting) and non-core (non-voting) groups and chaired by an elected core member. The **core members** included **paediatricians, epidemiologists, immunologists, public health specialists, infectious disease experts, and pharmacologists** drawn from **academic institutions, medical practice, and public health organizations**. Non-core members, such as EPI/MoPH employees, UNICEF, and WHO provided technical support. The National EPI served as its secretariat [21].

Figure 2

Theme 1 - NITAG maturity and operational challenges

Following its establishment in 2010, NITAG activity was evident through documented meeting minutes and the issuance of formal recommendations informing vaccine introduction decisions. After 2019, however, functionally declined, as reflected by the absence of regularly convened meetings, lack of renewal of appointed members' terms, and the absence of documented deliberations.

From the start, while the NITAG had a defined TOR, it lacked a publicly accessible procedure for disclosing conflicts of interest, as well as standard operating procedures governing issues such as membership termination, breaches of confidentiality, professional conduct, the formation of subcommittees and working group, and the conduct of open or closed meetings. Furthermore, no strategic plan or a communication strategy was available to guide its operation. Documentation of meetings was limited: only six meeting minutes during 2012-2018 were retrievable from the personal files of the NITAG secretariat **(Table S1).** Post-2018, no formal NITAG meetings were documented. This period coincided with a change in NITAG leadership and the lapse in renewal of member appointments. WHO Country Office financially supported the NITAG secretariat, covering members' travel and meeting expenses over the study period.

While the NITAG was envisioned as an independent technical advisory body, the study found persistent gaps in the group's technical capacity and ability to critically appraise and contextualise evidence for vaccine policy decisions. Several respondents noted that core members had limited familiarity with structured evidence appraisal frameworks, such as GRADE (Grading of Recommendations, Assessment, Development, and Evaluation) and the Evidence-to-Recommendation (EtR) framework[4-5]. Likewise, few members had the expertise to interpret complex forms of evidence, including cost-effectiveness analyses (CEA) and meta-analyses, which limited the NITAG's capacity to assess the contextual relevance of global evidence and translate it into actionable recommendations for Afghanistan's immunisation programme.

The Afghanistan NITAG faced several structural and operational challenges that limited its functionality and influence on vaccine policy decisions. Respondents consistently highlighted issues such as poor attendance, limited technical capacity, and low motivation among members, attributed in part to the unpaid nature of their work and the committee's limited institutional authority. The NITAG lacked the power to enforce participation or commitment, and the meetings were often described as bureaucratic, infrequent, and poorly documented.

A review of available NITAG meeting minutes corroborated those observations, revealing frequent absenteeism and a lack of systematic record-keeping. Only a handful of meeting minutes were retrievable for this study period, and even those showed incomplete attendance lists and limited evidence of deliberation on technical issues.

Communication barrier further constrained effective participation. Although meeting materials and discussion were conducted primarily in English, many national members had limited English proficiency, which hampered engagement and discouraged debate. As one former NITAG member explained:

*"I understood English, but it was difficult to express my opinion in English. Some members even couldn't understand a word [a word of English]. …whenever the meeting was shifted to local language, it became hard for international members to follow."***R4-Former NITAG member**

The study revealed that NITAG members faced challenges due to unreliable electricity and lack of access to computers and internet connectivity, hampering their ability to access important information. Additionally, some members lacked digital literacy which further complicated communication and information sharing, hindering effective decision-making.

" Some NITAG members didn't even have email addresses or basic skills to navigate online search. We had to deliver meeting agendas and reading materials in hard copies weeks before the NITAG meeting." ***R2*****- Former MoPH official**

Despite these constraints, few respondents regarded the overall decision-making process as relatively fair and functionally effective, as it ensured timely alignment with donor funding windows and facilitated

the introduction of key new and underutilized vaccines such as PCV and rotavirus, thereby reaching more children with life-saving vaccines [R3, R6, R11& R13].

In contrast to the NITAG, the Interagency Coordinating Committee (ICC) demonstrated strong participation and engagement. English was also the language of communication, but this did not pose a barrier since participants included senior MoPH officials, technical partners, and donor representatives, most of with medium to high English proficiency. ICC meetings were regular, well-attended and well-documented, and their recommendations were systematically recorded and implemented. The decision-making process followed a traditional format such as agenda items were presented (for example, by the EPI team or the HSS team), followed by an open discussion, and concluded with a vote by members to endorse the decision. Several participants noted that the high level of participation was likely due to the Chair of the ICC/HSS being a Deputy Minister.

Theme 2 – External influence

The network analysis (**Figure 3**) shows that MoPH sat at the centre of vaccine policy decision-making in Afghanistan. However, WHO, UNICEF and Gavi shared comparable influence and relatively high levels of inter-communication. IFRC/ARCS, Acasus and service provider NGOs were peripheral. Knowledge and power were high among MoPH/EPI, WHO, UNICEF, Gavi, but moderate to low among other donor agencies including JICA/Japan, service provider NGOs, and consultancy and humanitarian partners.

Several respondents perceived the formation of the NITAG as not being a fully country-driven process. As expressed by some participants, *"NITAG was not a country-driven initiative. It was formed by WHO to meet the grant application requirement and fulfil the formalities. As such, it was convened more frequently before the introduction of new vaccines, for example, before pneumococcal or rotavirus vaccine introduction, to release the preformulated recommendations"* [**R3 &R18 Former MoPH Officials, R4 Former NITAG member**]. These perceptions suggested that, in practice, the NITAG's role was viewed as largely procedural and externally driven, rather than a nationally initiated and fully autonomous mechanism.

The immunisation programme had a strong policy foundation, explicitly recognised in the Afghanistan National Development Strategy (ANDS), 2008-2013 and in national health policies (2010-2015, 2016-2020), as a key instrument for reducing morbidity and mortality. However, the EPI programme remained heavily depended on external funding, with limited domestic investment in immunisation activities. Most respondents indicated that donor funding and operational assessments often shaped policy agenda. In particular, Gavi, WHO, and UNICEF were frequently cited as promoting the introduction of new vaccines in line with funding opportunities, leading to their inclusion in the comprehensive multi-year strategic plans (cMYPs) for 2011-2015, 2015-2020, and 2021-2025- also known as the national immunisation strategy.

As one of the respondents explained, *"Where there is a Gavi window or grant available, those vaccines become priority for discussion and introduction"* (R2, Former NITAG Secretariat). A similar observation

was also reported by a former technical partner (R13).

"Partner favouritism fluctuated with their backgrounds—multilateral-leaning MoPH leaders prioritised WHO/UNICEF, and donor-experienced leaders leaned toward their former agencies." **(R3 Former MoPH Official)**

These perspectives suggest that donor funding availability, past implementation success, and financial feasibility were key determinants of vaccine introduction decisions, often outweighing national epidemiological priorities or systematic evidence-based assessments. As one former official reflected, *"The rational criteria for decision-making are things you read about in books. In practice, over the years, decisions in the MoPH have been donor driven. Data and figures are often collected and presented in ways that support those priorities"* (R6, former MoPH official).

The EPI Taskforce focused primarily on programmatic meetings and had EPI, WHO, and UNICEF as the main participants. Respondents noted that discussions were predominantly guided by UNICEF and WHO, who frequently shaped the final decisions, and it was felt that perspectives and contributions of other stakeholders were sometimes overshadowed. This dynamic raised concerns about the inclusivity of the decision-making process, potentially sidelining critical voices and affecting the diversity and adaptability of vaccine policies.

"The National EPI has the secretariat role of the [EPI] Taskforce, and the EPI manager chairs it. However, the discussion is steered by traditional partners (UNICEF, WHO)." ***R1- Technical partner***

Overall, most participants perceived vaccine policy decisions as largely predetermined and heavily influenced by technical partners and funding availability, with limited space for independent national deliberation. Several respondents noted that **agendas were typically set by partners (WHO, UNICEF, Gavi)**, and discussions across all three decision-making forums—the NITAG, the ICC, and the EPI Taskforce—tended to **validate pre-formulated recommendations rather than debate alternative options**. As a result, meetings often served a procedural function, focusing on endorsement rather than evidence appraisal or priority setting.

The EPI Taskforce often played a central role in discussions on introducing vaccines. Several respondents, including NITAG members and non-traditional partners, acknowledged the leading role of the EPI team, UNICEF, and WHO which was attributed to their extensive technical expertise and programmatic experience. While this expertise was invaluable, it also led to an imbalance in the decision-making process. Despite the positive attitudes within the EPI Taskforce, the homogeneity of its members presented a significant barrier and uniformity in backgrounds and perspectives reportedly stifled critical discussions. There was limited scope for diverse viewpoints to challenge prevailing assumptions and the contributions of non-traditional partners, whose unique insights were often overlooked or marginalised.

"*Homogeneous membership within the EPI Taskforce limited dissenting views*." **(R9 Technical partner)**

Figure 3

Theme 3 – Critical evaluation of evidence

The document review found no evidence of established guidelines or systematic procedures for assessing and synthesising evidence to inform policy decision across any of the vaccine decision-making platforms. Similarly, interview respondents consistently reported that absence of a structured framework for evaluating data or formulating policy recommendations. Most of the respondents indicated that the NITAG, which was expected to assess new vaccine evidence and produce policy recommendations, lacked a standardized approach for evidence synthesis.

Respondents also highlighted the limited national capacity for evidence generation and translation into policy recommendations, particularly during the early years [2002-2009] of the programme. Some reported that routine administrative data were the primary source for estimating disease burden. The WHO-led, hospital-based surveillance for rotavirus gastroenteritis conducted from 2013 to 2015 was the first country-level effort to document the burden, providing essential evidence for introduction of rotavirus vaccine in 2018 [22]. Surveillance data showed that 52% of acute gastroenteritis cases among hospitalised children under five years of age were attributable to rotavirus. These data also provided critical inputs for subsequent cost-effectiveness analyses.

"In the early years [2002-2005], most of the data came from donor-funded studies or expert opinion. For example, UNICEF and WHO each conducted their own assessments on maternal, infant, and under-five mortality. Because these agencies had the resources and could attract more funding, maternal and child health quickly became national priorities. Similar patterns were seen in immunisation. Even when the MoPH had country-specific data, such as for rotavirus, it could not decide on introducing the vaccine without significant donor support. In practice, a decision meant little if donors were not there to finance the intervention." **(R6, Former MoPH Official)**

Two cost-effectiveness analyses (CEA) were conducted in Afghanistan to inform new vaccine introduction – one for rotavirus and one for human papillomavirus (HPV) vaccines. Both studies were supported by PATH in collaboration with the London School of Hygiene and Tropical Medicine (LSHTM), with financial support from the Bill & Melinda Gates Foundation [23-24]. The studies were implemented in consultation with national counterparts, and one of the NITAG member served as co-investigator, facilitating access to data and national stakeholders. A review of the NITAG meetings minutes revealed no recorded discussion questioning who funded those studies, nor evidence that the findings were formally appraised during NITAG sessions. However, several respondents confirmed that the studies were presented to key government bodies, including the MoPH and the Ministry of Finance (MoF), the that their results were instrumental in demonstrating the economic and fiscal justification for co-financing commitments.

"Sectors' annual budgets were developed according to their contributions to the indicators outlined in the Afghanistan National Development Strategy (ANDS) and the sector strategy. Suppose an additional

budgetary request came to MoF and it was aligned with the ANDS and had a significant contribution to the social service indicators [reduced mortality and morbidity or contributed to poverty reduction] then the MoF could approve it... Rotavirus had strong evidence [CEA] which was appreciated by the Ministry of Finance." **R17- former MoF Official.**

"We presented the value added of HPV vaccine using findings of economic evaluation and convinced the MoF for co-financing. We were getting ready to introduce HPV vaccine in 2022, but with the change of government, everything stopped." **R5- Former MoPH Official.**

Several respondents confirmed that Afghanistan mainly relied on SAGE recommendations, WHO position papers and WHO pre-qualification (i.e. approval) to license antigens. Collectively, the respondents confirmed that WHO guidelines were considered a blueprint, and if a vaccine was recommended by WHO, they all accepted it. They also mentioned that it would be a lengthy process if a country with limited technical and financial resources like Afghanistan attempted to generate its own evidence. As such, most decision-making processes have relied on WHO and UNICEF presentations on evidence summary and operational feasibility, followed by a brief discussion in those committees, namely EPI taskforce, ICC, and NITAG.

"I attended several NITAG meetings in other countries in the region and beyond; the members were technically sound and strong, contributing meaningfully to the discussion, and providing critical feedback and the meetings were more dynamic. This was what we expected from such an advisory group. When I compare the meetings, I attended here [Afghanistan], the technical partners [WHO mainly and UNICEF] lead and steer the discussion and the NITAG members easily agree on what is presented to them." **R1-Technical partner**

According to WHO's *Guidance for NITAGs* and its *decision-making framework for vaccine introduction*, national immunisation programmes are expected to systematically evaluate and compare vaccine options based on seven criteria: 1) public health problem (burden of disease); 2) benefits and harms (safety and efficacy); 3) resource use; 4) values and preferences; 5) equity; 6) acceptability; and 7) feasibility [5]. In Afghanistan, these assessments were discussed primarily within the EPI Taskforce and NITAG and subsequently presented to ICC for endorsement before receiving final approval from the Health Minister **(Figure 2)**.

For introduction of both rotavirus and PCV vaccines, the vaccine policy choice was influenced mainly by vaccine price, market availability, and cold chain logistics. At the time of ROTARIX introduction in 2018, ROTASIIL and ROTAVAC were not licensed, and ROTATEQ was not being widely used in LMICs. The decision therefore aligned with both WHO recommendations and Gavi's procurement mechanisms, which offered *Rotarix* at a subsidized price with only US$ 0.2 per dose through UNICEF Supply Division.

For **PCV**, the decision process was shaped less by internal deliberation and more by **external market and supply factors**. Although the technical review initially supported the adoption of **PCV10**, based on WHO and UNICEF modelling and evidence showing adequate serotype coverage for Afghanistan, global supply

disruptions in 2013–2014 led to **shortage of PCV10**. Consequently, Afghanistan introduced **PCV13**, which was available through Gavi's global supply pool and offered at a comparable co-financing cost.

"… for introduction of PCV- all evidence and statistics were prepared [by WHO and UNICEF teams] showing PCV-10 was the best option for Afghanistan, and we all were convinced. At the time of introduction, I believe, there was a global shortage of PCV-10. Finally, Afghanistan introduced PCV-13. What surprised me the most was that technical partners first favoured evidence to PCV-10 but with some logistical issues they shifted evidence and statistics to show that indeed PCV-13 was the best option for Afghanistan." ***R3-Former MoPH***

Given all newly introduced vaccines were funded by Gavi, programmatic feasibility emerged as the dominated consideration in vaccine-decision-making processes. We found that the EPI team placed the greatest emphasis on practical implementation factors when preparing Gavi grant applications, particularly **cold-chain capacity, vaccinator training, and community engagement**. They were least concerned about vaccine performance and safety as they relied entirely on SAGE-endorsed recommendations. A few mentioned that operational aspects take precedence for new vaccines in the country due to limited technical and financial resources to assess the vaccine.

*"The core team [EPI, WHO, and UNICEF] makes decisions based on implementation feasibility. Eventually, it goes to MoPH to endorse it. Ultimately, the key decisions are made at the operational level."***R13- Technical partner**

Theme 4 – Cultural barriers

Deference to seniority often muted debate and delayed decisions. Age-based respect and organizational hierarchy often took precedence over professional scrutiny, leading to near-automatic endorsement of proposals once the chair signalled approval.

"...our culture of respect [respect to seniors based on their age] dominated professionalism, leading to blind agreement or acceptance. I recall an instance when a document wasn't approved because a senior colleague unnecessarily thought that cMYP wasn't in the standard strategy format. One senior individual caused us several months delay." ***R9-Technical partner***

or,

"I cannot remember a single occasion that a proposal came to the ICC for endorsement and was rejected. When the chair showed agreement, all other members agreed." **R7-fromer MoPH** Official (**R14-NGO** shared almost similar opinion).

We found a significant gender gap in both vaccine decision-making platforms and EPI programme management. Women were largely absent from Afghanistan's immunisation governance including decision-making. Since NITAG's inception, only three women have served as core members, and the EPI management team has had just one female unit head.

We also identified evidence of a culture of resource competition among multilateral organisations. Collaborative efforts generally fostered an environment conducive to success, enabling teams to work effectively towards common goals (Figure 3). However, we also identified occasional conflicts, particularly over resource competition, which were most pronounced among multilateral agencies, where differing priorities sometimes led to the duplication of certain interventions such as capacity building, community mobilization, etc. Such conflicts mainly risked inefficiencies in programme implementation and strained relationships among stakeholders [**R7, R9 Former MoPH Officials**].

"*Collaboration was generally cordial, yet resource competition among multilateral organisations occasionally duplicated activities.* **(R9 Technical partner)**

Discussion

This study provides the first empirical characterisation of Afghanistan's vaccine-policy ecosystem during the decade preceding the 2021 regime change. By triangulating document review, stakeholder network mapping and expert interviews, we found that responsibility for immunisation policy was nominally distributed across three bodies, the programme-focused EPI Taskforce, the resource-allocating ICC, and the advisory body NITAG. In practice, however, meaningful agenda-setting power rested with four actors: the EPI team, WHO, UNICEF and Gavi. This configuration fostered a donor-steered, programme-centred process reliant on external guidance and financing, with limited capacity for independent, country-specific evidence generation, appraisal, and synthesis.

The NITAG's establishment was largely externally driven, which may partly explain its limited ability to contextualize global recommendations, appraise evidence systematically, and function as an independent technical body. These findings align with studies from other LMICs and crisis-affected countries reporting NITAGs constrained by limited budgets, analytical capacity, weak conflict-of-interest safeguards, and poor digital infrastructure [12, 25-26]. In Afghanistan, some NITAG members lacked digital literacy, hindering access to online resources and limiting participation in evidence-informed discussions [27-28].

Although WHO guidance specifies that the NITAG should provide independent technical recommendations subsequently endorsed by the EPI and the Ministry of Health, this process was largely reversed in Afghanistan. Operational feasibility and partner priorities often drove vaccine introduction decisions, with the NITAG validating rather than initiating recommendations. Re-establishing NITAG autonomy and embedding its advisory role within national policy processes will be critical to align practice with WHO standards for evidence-based immunisation governance.

Strengthening the NITAG and promoting evidence-based decision-making will require building on the country's existing but uneven expertise base. While Afghanistan has a growing cadre of professionals in epidemiology, immunisation management, and public health, capacity remains limited in health economics, disease modelling, and evidence synthesis. Targeted investment in multidisciplinary skills- clinical, surveillance, and analytical- alongside institutional reform is essential to ensure that

recommendations are generated and reviewed nationally. Examples from Sri Lanka, India, Bangladesh, and Morocco, though contextually distinct, offer valuable lessons for institutional strengthening [29-32].

Our study identified a few but impactful economic evaluations that demonstrated the potential for building national analytical capacity. The application of the UNIVAC decision-support model enabled Afghan experts to generate country-specific CEA evidence for rotavirus and HPV vaccines [23-24]. These analyses provided the first in-country economic evidence that informed policy dialogue and helped to secure the Ministry of Finance's commitment to co-financing new vaccines. However, Afghanistan's recent political, security, and economic instability has further eroded this emerging capacity. The 2021 regime change triggered an extensive **brain drain**, disrupting professional networks and continuity in policy processes [33]. While the current context limits formal collaboration, **mobilising the Afghan scientific diaspora** and fostering **partnerships with regional and global institutions** remain realistic medium- to long-term strategies. These networks could play a critical role in rebuilding analytical capacity, mentoring national experts, and supporting remote technical collaboration for evidence-informed immunisation policy once conditions allow.

Afghanistan has demonstrated its capacity for gathering and using country-level evidence for programmatic considerations such as feasibility, budget, resources, and logistics. However, this strength may have led to decisions that were primarily driven by Gavi grants and funding and these programmatic considerations, with less attention given to other decision criteria, such as long-term effectiveness, broader societal impact or alignment with other health priorities.

Our study has several limitations. First, the interviews were conducted in two distinct periods spanning the 2021 political transition, which may have introduced differences in respondents' interest, availability, and openness, potentially leading to selection or response bias. National experts now living in exile also faced constraints in expressing their perspectives due to ongoing uncertainty and personal security concerns, while widespread anxiety about the future of pre-2021 health-sector achievements may have influenced participants' judgements. Second, the 2010–2021 study window, covering major vaccine policy decisions such as introduction of PCV (2013), the hepatitis B birth dose (2014), the polio switch (2016), and rotavirus (2018), presents a risk of recall bias due to elapsed time. However, most interviewees had long-standing engagement in Afghanistan's immunisation programme, which helped ensure the accuracy of retrospective accounts. Third, the study's broad focus on 'vaccine policy decisions' may have overlooked details specific to individual policy questions. Potential confirmation bias related to the interviewer's background was mitigated through the use of standardised interview guides, adherence to reflexivity protocols, and periodic methodological reviews with the research team. Finally, the study did not collect or analyse gender-disaggregated data, and potential gender and equity dimensions of vaccine decision-making were not explored. Future research should examine these aspects more systematically. Despite these limitations, the study offers an in-depth empirical account of Afghanistan's vaccine policy ecosystem in a fragile context, drawing on diverse stakeholder perspectives and access to key program documents not previously analysed.

In conclusion, improving the transparency and context-sensitivity of Afghanistan's vaccine policy process will require practical and phased reforms grounded in current political and resource realities. While full institutional autonomy may not be immediately attainable given ongoing dependence on external financing and operational constraints, incremental strengthening of procedural and technical capacities remains feasible. Priority actions include structured, modular capacity-building for NITAG members to enhance interpretation of country-specific epidemiological and operational data; adoption of simplified and standardised evidence appraisal templates aligned with WHO guidance but adapted to local context; and improved documentation of deliberations to increase transparency and institutional memory. Gradual broadening of technical participation within existing governance platforms may further strengthen national ownership without requiring major structural change. These pragmatic steps, implemented within current constraints, could improve consistency, accountability, and evidence use in vaccine decision-making while recognising the continued influence of donor financing and operational imperatives.

Abbreviations

ANDS – Afghanistan National Development Strategy

ARCS – Afghan Red Crescent Society

CEA – Cost-Effectiveness Analysis

cMYP – Comprehensive Multi-Year Plan

EPI – Expanded Programme on Immunisation

EtR – Evidence to Recommendation

EU – European Union

HPV – Human Papillomavirus

HSS – Health System Strengthening

HTA – Health Technology Assessment

ICC – Inter-Agency Coordination Committee

IFRC – International Federation of Red Cross and Red Crescent Societies

LMICs – Low- and Middle-Income Countries

JICA – Japan International Cooperation Agency

MoPH – Ministry of Public Health

NGO – Non-Governmental Organization

NITAG – National Immunisation Technical Advisory Group

PCV – Pneumococcal Conjugate Vaccine

VPD- Vaccine Preventable Disease

WB – World Bank

WHO – World Health Organization

Declarations

Conflict of interest:

The authors declare no conflict of interest.

Ethical approval

This study was conducted in accordance with the principles of the Declaration of Helsinki and relevant national and institutional ethical guidelines. Ethical approval was obtained from the London School of Hygiene and Tropical Medicine Research Ethics Committee (Ref. 2610/20-4-2021) and the Afghanistan Ministry of Public Health Institutional Review Board (Ref. A.05/05-05-2021-21.03.02). Written informed consent, including permission to conduct and audio-record interviews, was obtained from all participants prior to data collection.

Declaration of interests

All authors declare no competing interests.

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Author Contribution

PA and AC jointly developed the study concept and designed the methodology. PA was responsible for conducting the data collection, administering the semi-structured interviews, performing data analysis,

and producing the tables and figures. Additionally, PA wrote the initial draft of the manuscript.AC, KA, NS, SMJ and CS provided critical scientific input throughout the research process and contributed to the refinement of the manuscript. All authors reviewed and revised the manuscript and approved the final version for submission.

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Data Availability

The individual-level data that support the findings of this study are not publicly available due to privacy restrictions. Aggregated data are available in the article and its supplementary materials. Researchers may request access to restricted datasets upon reasonable request to the corresponding author and subject to institutional review and data use agreements.

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Table

Table 1. Characteristics of key informants

Characteristics of individuals (n=18) who participated in key informant interviews conducted between 2021 and 2022. The characteristics are categorized by gender, institutional affiliation, operational level, experience, and interview format.

Category	Sub-category	Count (%)
Gender	Male	15 (83.3)
	Female	3 (16.7)
Affiliation	NITAG	5 (27.8)
	Government (Ministry of Public Health)	6 (33.3)
	Development partners and donor agency	6 (33.3)
	Government (Ministry of Finance)	1(5.6)
Operational level	National	14 (77.8)
	International	4 (22.2)
Experience in Afghanistan immunisation decision-making	< 5 years	3 (16.7)
	5–10 years	8 (44.4)
	> 10 years	7 (38.9)
Interview format	In-person	4 (22.2)
	Virtual	14 (77.8)

Figures

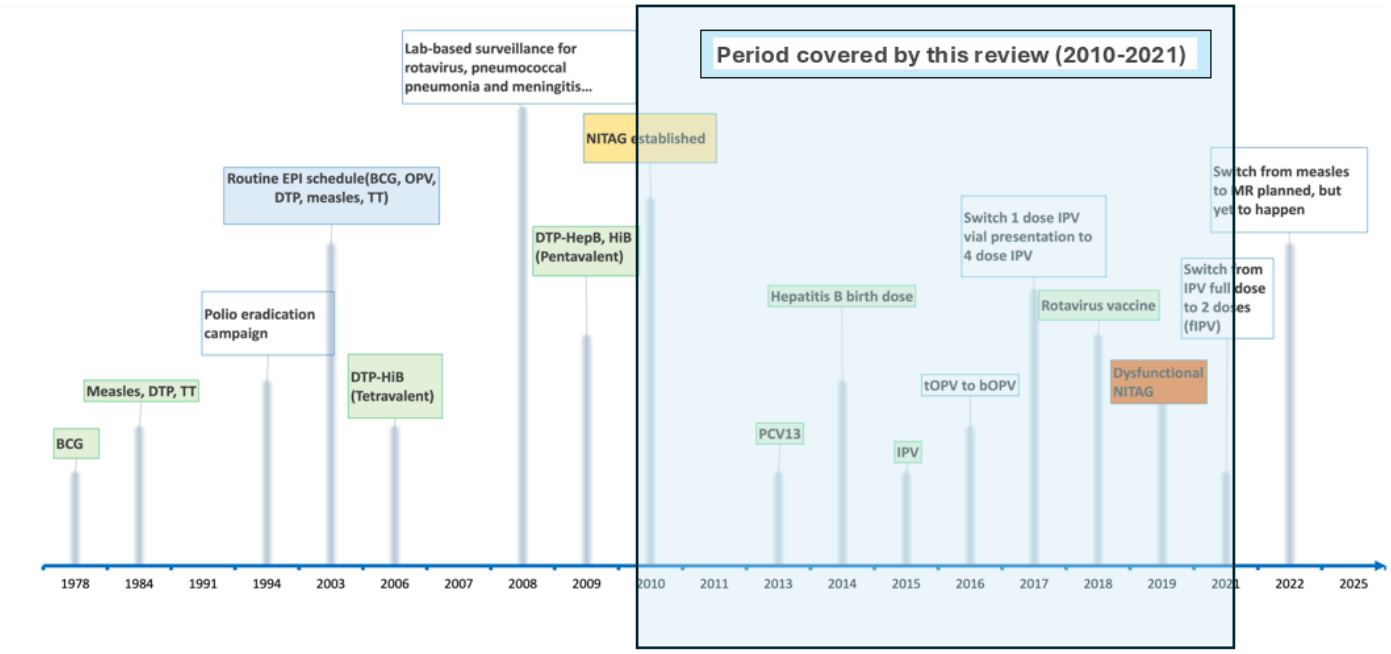


Figure 1

Timeline of key immunisation events in Afghanistan, 1978–2022. The figure illustrates the chronological introduction of new vaccines, changes in vaccine schedules, and relevant programme milestones, based on national immunisation records. The green boxes represent the new vaccine introductions during 2010-2021.

BCG – Bacillus Calmette–Guérin; **DTP** – Diphtheria–Tetanus–Pertussis; **EPI** – Expanded Programme on Immunisation; **fIPV** – Fractional Inactivated Poliovirus Vaccine; **HiB** – *Haemophilus influenzae* type B; **IPV** – Inactivated Poliovirus Vaccine; **MR** – Measles and Rubella; **NITAG** – National Immunisation Technical Advisory Group; **OPV** – Oral Poliovirus Vaccine; **PCV** – Pneumococcal Conjugate Vaccine; **tOPV** – Trivalent Oral Poliovirus Vaccine; **bOPV** – Bivalent Oral Poliovirus Vaccine; **TT** – Tetanus Toxoid

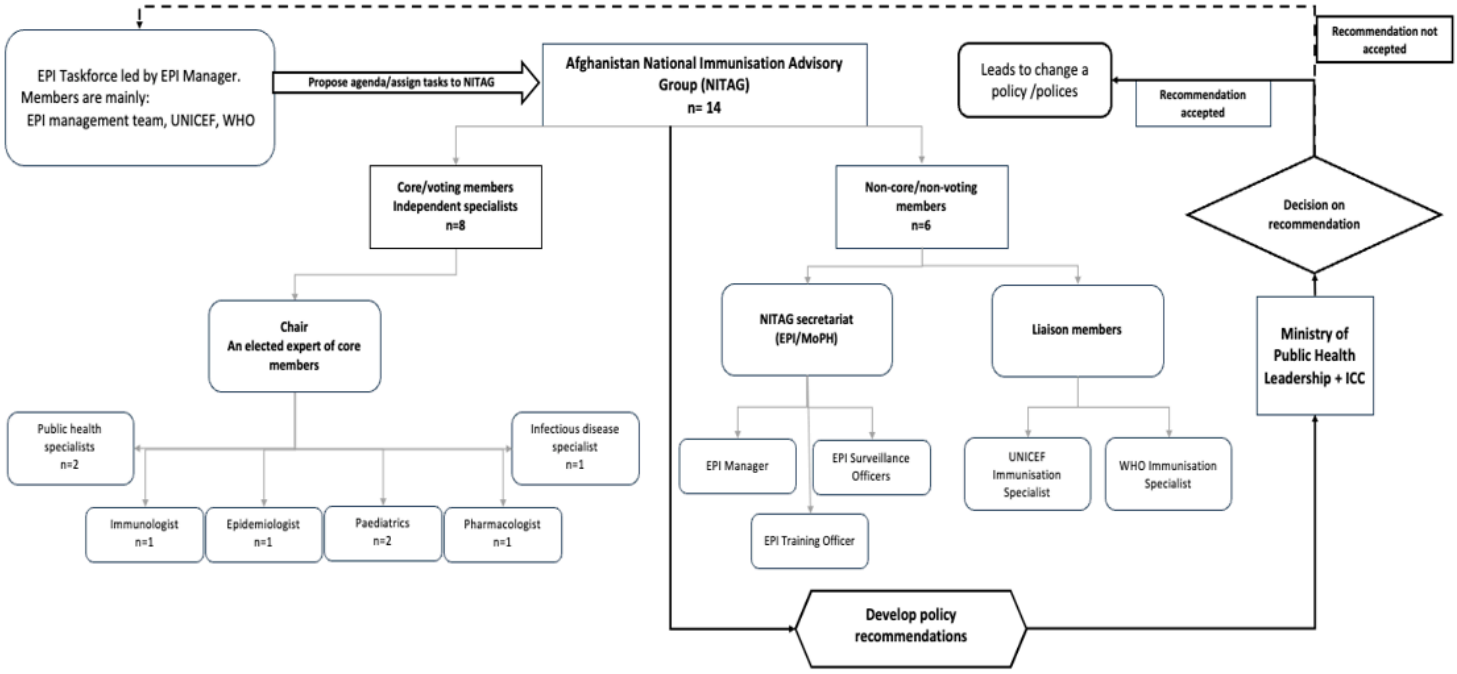


Figure 2

Structure and decision-making process of Afghanistan's National Immunisation Technical Advisory Group (NITAG), 2021–2022.

The figure depicts the organisational structure and workflow linking the EPI Taskforce, NITAG, and the Inter-Agency Coordinating Committee (ICC) in vaccine policy decision-making. Independent specialists within the NITAG represent diverse areas of expertise, including paediatrics, immunology, pharmacology, health economics, infectious disease, social sciences, and public health. Arrows indicate reporting and recommendation pathways, showing how technical advice from the NITAG informs the Ministry of Public Health and ICC decisions.

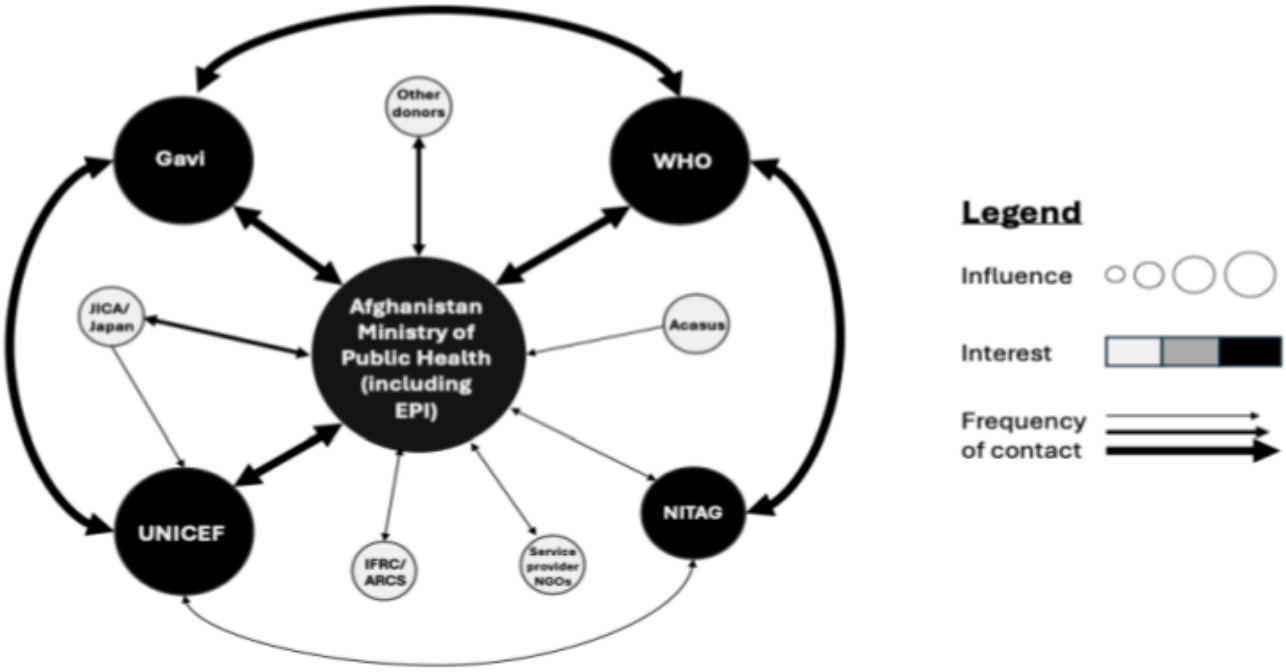


Figure 3

Network map of immunisation decision-making partners. The network of partners involved in the Expanded Programme on Immunisation (EPI) decision-making process in Afghanistan, based on data from 2021-2022. The stakeholder network map was constructed by combining data from the interview participants (about relationships and frequency of contact) and from the scores assigned to each stakeholder by the interviewer and lead author of the study, using the Balane et al framework*. In the network map, Influence is defined as the sum of all scores for the knowledge and power categories. Interest is defined as the sum of all scores for interest and position i.e. level of support for vaccine policy decision making. The thickness of the arrows connecting the different stakeholders reflects the sum of the number of contacts between stakeholders in the past year.

*Balane MA, Palafox B, Palileo-Villanueva LM, McKee M, Balabanova D. *Enhancing the use of stakeholder analysis for policy implementation research: towards novel framing and operationalised measures.* BMJ Glob Health, 2020. **5**(11).

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