

SHORT REPORT



## Global immunization systems strengthening through pediatric societies: the promise of private–public partnerships in Indonesia

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### ABSTRACT

Vaccines are one of the most successful health interventions in history. Yet, vaccine-preventable diseases still claim the lives of 2.5 million individuals globally every year. Approximately 60% of the 19.4 million infants that did not have access to routine immunization services in 2018 live in 10 countries, one of which is Indonesia. In order to reach global targets, it is critical for countries such as Indonesia to prioritize, tailor, and operationalize vaccination strategies to address immunization gaps. Pediatricians and national pediatric societies (NPS) are trusted stakeholders in their countries and are uniquely qualified to promote vaccination programs. The American Academy of Pediatrics (AAP) partnered with the Indonesian Pediatric Society (IPS), with support from the US Centers for Disease Control and Prevention (CDC), to initiate a multiyear project to build the capacity of IPS, individual members, and other child health clinicians to strategically advocate for improved immunization services across both public and private sectors.

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### Introduction

Vaccines are one of the most successful public health interventions in history averting 2 to 3 million deaths annually. Yet, vaccine-preventable diseases still claim the lives of 2.5 million individuals globally every year.<sup>1</sup> The World Health Organization (WHO) started the Expanded Program for Immunization (EPI) in 1974 to reduce deaths from six diseases: tuberculosis, diphtheria, tetanus, pertussis, measles, and poliomyelitis. In 2018, 44 y after the introduction of EPI, 116 million infants worldwide, 9 in 10, received at least one dose of diphtheria-tetanus-pertussis (DTP) vaccine.<sup>2</sup> However, the percentage of children who received their full course, three doses (DTP3), has remained at 85% since 2015.<sup>3</sup> While overall coverage is high, full-dose coverage is not improving. Of the 19.4 million children who were not reached with routine immunization services, such as DTP3 in 2018, 60% live in 10 countries, one of which is Indonesia.<sup>2</sup>

Based on 2019 data, approximately 4.8 million neonates are born in Indonesia each year.<sup>4</sup> This enormous number of children is at risk of contracting infectious diseases preventable by immunization. The Indonesian government launched EPI in 1977, showing an early commitment to improving immunization coverage. However, according to country estimates, immunization coverage has remained stagnant at 85% since 2015, with only 77% of districts achieving greater than 80% DTP3 coverage as of 2017.<sup>3</sup> Indonesia's EPI program is falling short of the WHO and United Nations International Children's Emergency Fund (UNICEF) target to reach 90% of

children under the age of one nationwide and at least 80% in every district by the year 2020.<sup>1</sup> According to the Indonesian Ministry of Health (MOH), low coverage can be attributed to cost, access to health facilities, vaccine hesitancy, and low education and knowledge around vaccines.<sup>4</sup>

In 2014, Indonesia launched a new health-care policy, known as Jaminan Kesehatan Nasional (JKN), that sought to use private-sector providers as a solution to help the country achieve universal health coverage. The private health sector has steadily grown since JKN was introduced; as of 2016, the private sector made up 44% of hospital-based care and 52% of ambulatory care nationwide.<sup>5</sup> Subsequent reports show that the proportion of care received in the private sector is growing and may be over 60% to date.<sup>6,7</sup> With such a large portion of the population seeking care in the private sector, it is critical to proactively engage and synchronize health service delivery between private and public sectors.

However, coordination and regulation of private-sector care have not expanded as quickly as service delivery, which has led to unreliable and disconnected information systems, inadequate monitoring of the quality of care and pharmaceuticals, and fraudulent reimbursement claims by providers.<sup>8</sup> In recent years, these factors have been highlighted by a scandal over counterfeit vaccines administered to children in the private sector. Without regulation and a coordinated immunization supply chain, the increased demand for private-sector vaccination services led to a scarcity of locally produced vaccines. In order to meet demand, private hospitals and

clinics imported vaccines that were subsequently determined to be counterfeit.<sup>9</sup> The scandal sparked public uproar and exposed major gaps in Indonesia's health system.

Considering JKN and the increase in the market share of private-sector providers, there is a clear need to engage private-sector actors and improve coordination between sectors to improve health service delivery, particularly for children, and to support Indonesia in meeting its national health goals.

In order to reach global coverage targets, it is critical for countries similar to Indonesia to prioritize, tailor, and operationalize vaccination strategies to address immunization gaps. Pediatricians and national pediatric societies (NPS) are trusted stakeholders in their countries and are uniquely qualified to promote vaccination programs. However, they are often unengaged with the public sector immunization program and do not use the influence they can have in advocating for child health and strengthening health systems.

In 2016, the American Academy of Pediatrics (AAP) began a global project partnering with national pediatric societies across Sub-Saharan Africa and Asia. From 2016 to 2019, the project has worked with the national pediatric societies in Democratic Republic of Congo, Indonesia, Ethiopia, Kenya, Nepal, Nigeria, Tanzania, Uganda, and the Philippines, with support from the US Centers for Disease Control and Prevention (CDC). The phased approach intervention (see [Figure 1](#)) was implemented by AAP in each country. Due to the specific needs of each country's immunization program and pediatric society goals, project activities and outcomes were vastly different across geographic areas (see [Table 1](#)). In order to assess the possible impact of NPS engagement in immunization advocacy, the rest of this paper will focus on IPS' unique implementation of the phased approach (see [Figure 2](#)).

In Indonesia, three main priorities were identified through the initial needs assessment for ongoing project planning and future advocacy:

- (1) Integrating public and private vaccine service delivery data;
- (2) Combatting vaccine hesitancy;
- (3) Patient and community communication.

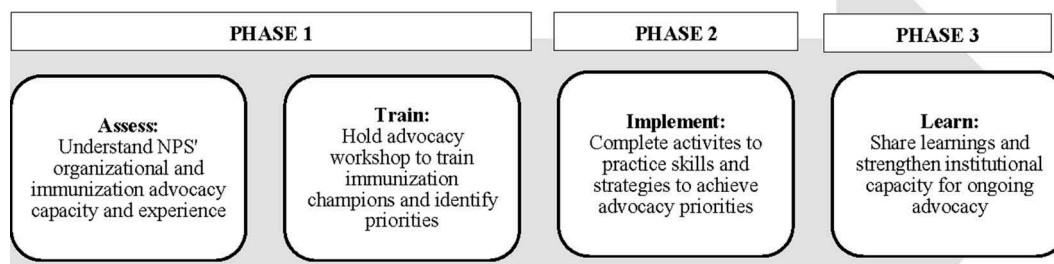
### Phase 1: advocacy training

IPS and AAP hosted a 2-d advocacy workshop. The first day entailed preparing 10 IPS leaders to serve as core immunization advocacy champions and focused on building key advocacy skills as well as providing guidance on how to act as advocacy mentors. The overall goal of day one was to ensure the core IPS champions had the knowledge and confidence necessary to advocate more strategically, especially regarding coordination between public and private sectors. The second day consisted of training 50 additional champions, alongside the initial 10 (total of 60), in an IPS-developed electronic immunization data collection and reporting system (IPS-PEDIATRIC Online Immunization Reporting System: I-POINTS) for private-sector tracking of the use of EPI and non-EPI vaccines. This second day also included immunization advocacy and practical skills related to using data to improve practice-level service delivery and combatting vaccine hesitancy.

### Phase 2: advocacy in action

To improve public and private-sector coordination, IPS trained additional 143 pediatricians from districts across the country in improving immunization advocacy and providing vaccine education in daily practice and the use of I-POINTS. During this time period, IPS continued to build their relationship with the MOH Immunization Program and gained buy-in for a parallel vaccine information system to the I-POINTS reporting system.

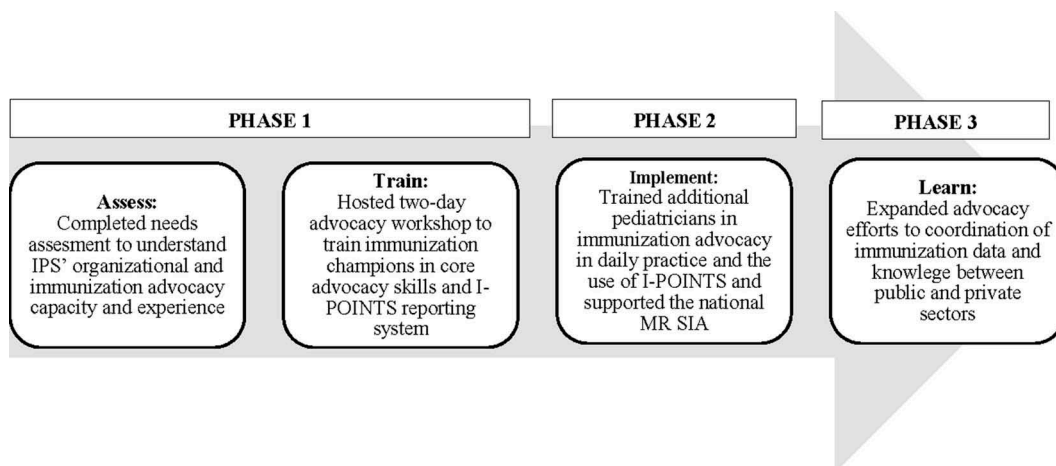
IPS also held a virtual symposium on measles-rubella (MR) vaccination in 2017 to improve pediatric engagement and support of the national Measles-Rubella Supplemental Immunization Activity (MR SIA) in Indonesia. The symposium was attended by 162 pediatricians from across Indonesia. To reach the general public, IPS produced three immunization advocacy public service videos and held press conferences on the MR campaign and common misconceptions about immunizations that aired on local television. The public-facing messages included coordination between IPS, MOH, and other national-level stakeholders.



**Figure 1.** General AAP phased approach to pediatric society immunization advocacy strengthening.

**Table 1.** Major achievements of AAP partner pediatric societies' immunization advocacy strengthening.

Implementing Pediatric Society	Major achievements
Ethiopian Pediatric Society	Developed culturally appropriate job aids to improve immunization counseling and provider interaction in Afar & Gambella
Kenya Paediatric Association	Created immunology training course in coordination with MOH Developed cross-cadre training curriculum on cadre-specific roles in immunization service delivery that will reach 86% of immunization workforce
Nepal Pediatric Society	Piloted hospital-based course in 6 County Hospitals with an 80% improvement in immunization knowledge Trained 100 frontline vaccinators in AEFI detection/reporting, vaccine preventable disease counseling, and referrals in 6 out of 7 provinces Published updated immunization guidelines (both publicly and privately available vaccines), including notes on national advocacy for society members
Pediatric Association of Nigeria	Obtained written commitments for sub-national financing by six permanent secretaries and advocated for 1% increase for health care financing to support immunization services at the national level in Nigeria
Pediatric Association of Tanzania	Developed web-based advocacy training module to link national and sub-national members and priorities Trained 20 religious leaders, 20 media outlet leaders, and hosted 6 national televised media engagements to promote routine immunization
Philippine Pediatric Society	Trained 160 child health workers in immunization information and service delivery across 3 districts 100% of chapters provide ongoing immunization advocacy at sub-national level and have engaged more than 2,000 pediatricians Developed immunology course to combat vaccine hesitancy and clinical misinformation following Dengvaxia vaccine introduction and crisis
Pediatric Society of the Democratic Republic of Congo	Trained 20 members as immunization champions (recently completed Phase 1).
Uganda Pediatric Association	Trained over 100 private providers to improve quality of immunization service delivery in 2 districts selected by MOH Launched national-level media campaign for RI and rota-virus vaccine introduction

**Figure 2.** Phased approach to Indonesian pediatric society immunization advocacy strengthening.

### Phase 3: sustaining immunization advocacy

IPS expanded their advocacy efforts to the coordination of immunization data and knowledge between public and private sectors to increase immunization coverage and data recording by:

- (1) Training “fresh graduate” pediatricians, who were in a compulsory deployment program to rural areas, on immunization advocacy and the I-POINTS reporting system;
- (2) Establishing linkages for immunization advocacy between IPS and the Indonesian Medical Association and Indonesian Midwives Association who provide care to infants and children;
- (3) Developing an immunization reporting protocol connecting private practitioners and the MOH for quality assurance and advocacy.

IPS trained additional 203 pediatricians on conducting immunization advocacy in their daily work settings, data

collection using the I-POINTS platform, and how to use service delivery data in advocacy. To support these trainings, IPS developed immunization advocacy and reporting handbooks, as well as a video tutorial explaining how to record and report immunization services using the I-POINTS platform, ensuring dissemination of I-POINTS to an increased number of members.

To further strengthen coordination between sectors, the training was adapted for “fresh graduate” pediatricians that were to be deployed to rural health facilities for 1 y as required by JKN; 100% (n = 97) of the “fresh graduate” pediatricians during the project time period were trained. Additionally, IPS trained 50 general practitioners (GPs) and 80 midwives in immunization advocacy in collaboration with the Indonesia Medical Association and the Indonesia Midwives Association. While these private practitioners also deliver care to infants and children through JKN, they receive little training on the importance of vaccines and support from the MOH.

Work is still underway to develop a reporting protocol in coordination with the MOH to connect private and public sector reporting systems.

## Materials and methods

This study served as an evaluation of the Indonesia arm of the intervention and sought to determine if there was an improvement in coordination between public and private-sector immunization service delivery and if key immunization stakeholders viewed IPS as a leader in that coordination. All advocacy and coordination activities were implemented for about 3 y at the time data were collected. The study design and interview questions were assessed for accuracy and appropriateness to the local context by IPS leadership. Of the majority of project, activities were implemented on Java island, including DKI Jakarta, West Java, Banten, Central Java, and DI Yogyakarta. These five provinces are the most inhabited in Indonesia and still face some serious immunization coverage problems.<sup>10</sup> Based on 2017 data, the proportion of children who received measles immunization at 9 months of age was only 74% in DKI Jakarta, 69% in West Java, 76% in Central Java, 86% in DI Yogyakarta and 67% in Banten.<sup>11</sup> The percentage of children who received all routine immunizations by 23 months is also well-below national targets: 69% in DKI Jakarta, 55% in West Java, 75% in Central Java, 86% in DI Yogyakarta and 30% in Banten.<sup>12</sup>

To address study aims, both qualitative and quantitative data were collected early- to mid-2019 from the following sources and stakeholders: IPS end of project reports, web-based survey, and in-person interviews and focus groups.

**End of project reports:** IPS submitted end of project reports to AAP following phases one, two, and three of the project, each one summarizing proposed project objectives, the status of activities, and reporting on project indicators. A desk review of these reports was completed to evaluate IPS' achievements compared to priority objectives.

**Web-based survey:** The web-based survey was sent to the 10 core immunization advocacy champions to evaluate self-efficacy, impressions of IPS' leadership in guiding advocacy priorities, and areas for IPS to further support advocate development. A total of seven surveys were completed by May 2019.

**In-person interviews and focus groups:** Retrospective, semi-structured, qualitative interviews and focus groups were carried out with multiple stakeholders. The interviews aimed to evaluate stakeholder perception of coordination between the private and public sectors and IPS' role in that coordination. Stakeholders were interviewed from three locations across the country where project implementation occurred: Way Kanan, Lampung Province; Jakarta; and Serang, Banten. Participants included IPS champions; pediatricians trained in advocacy living in rural areas, including a "fresh graduate" pediatrician; district government officials; general practitioners (GPs); nurses; midwives; and representatives from WHO and UNICEF.

Data were analyzed to identify themes indicating successes and challenges as related to project goals. Successes were defined as intentional and unintentional actions or attributes that led to increased data collection for the vaccine system, public/private coordination, and patient/community communication resulting in increased vaccine confidence.

## Results

While IPS faced some challenges in establishing long-term relationships with the national MOH, impacts in improved immunization coverage in rural areas and improved attention to immunization service provision in private providers highlight the potential for national pediatric societies to effectively influence immunization systems improvement.

The three broad themes that emerged from the data related to successes were: (1) increased coordination across public and private sectors; (2) improved service delivery; and (3) strengthened institutional capacity for advocacy and immunization systems support (See Table 2).

### *Increased coordination across public and private sectors*

Over the 3-y project, IPS worked to strengthen their relationship with the MOH and other national public and private stakeholders regarding data collection and alignment of messages for immunization service providers across sectors.

### *Data systems*

IPS trained over 300 pediatricians and more than 100 GPs and midwives in immunization advocacy skills and data collection. Furthermore, the implementation of I-POINTS across the pediatric private sector has resulted in over 24,000 immunization service entries (25% of private pediatricians reporting) as of December 2018. IPS is currently working with the MOH and the National Immunization Technical Advisory Group (NITAG) to establish a mutual agreement on how to best utilize the data; as well as, linking I-POINTS to the MOH's immunization reporting system, which is under development.

### *Coordinated messaging across sectors*

As a part of the IPS advocacy training, pediatricians across three districts learned how to develop immunization-related communications and messages that aligned with and supported public sector messaging. This approach was adapted for the 2018 public sector MR SIA. IPS took a leadership role in this campaign and worked with chapters in each district to ensure that both private and public sector providers were sharing the same messages about the safety and benefits of vaccines.

Similarly, these training approaches were adapted for private-sector GPs and midwives. To support effective coordination, IPS has taken a lead role in training and providing ongoing supportive supervision to the Indonesia Medical Association and Indonesia Midwives Association. As a result of these activities, both GPs and midwives have reported increased comfort and self-efficacy in discussing vaccines with patients and families.

### *Improved service delivery*

An unexpected outcome of the IPS engagement was an improvement in both access to immunization services and immunization coverage.



**Table 2.** Major achievements of Indonesian pediatric society immunization advocacy strengthening with primary outcomes and component indicators.

Achievement	Outcomes and component indicators
Increased coordination across public and private sectors	<p>Set up immunization program working with local government officials and health department to train around 858 people (nurses, midwives, GPs, and health workers) in WayKanan district</p> <p>Developed I-POINTS reporting system and obtained letter of intent to coordinate with public immunization data system in the future.</p> <p>Conducted online symposium on the Importance of Measles-Rubella Vaccination, per the national MR Supplementary Immunization Activity (SIA)</p> <p>Received award from MOH for expert role in the successful 2018 MR campaigns (also more than 95% of immunization MR coverage) at national and sub-national levels</p> <p>Established Memorandum of Understanding (MOU) with the Indonesian Medical Association and the Indonesian Midwives Association to train health care providers on advocacy and data collection</p> <p>Served as the major resource for information and education regarding immunization for private sector GPs and midwives in Banten district</p> <p>Established an immunization consulting service between private sector GPs, midwives and IPS pediatricians in Banten district</p> <p>Gained strong support from district government leaders and Indonesian Ulema Council (Majelis Ulama Indonesia) on immunizations and protection of infants and children in WayKanan district</p> <p>Obtained letter of commitment to increase immunization coverage and ending vaccine-preventable disease outbreak signed by public and private stakeholders</p>
Improved service delivery	<p>Set up immunization clinic and recording protocol through I-POINTS at Hermines Kemayoran hospital (private) in central Jakarta</p> <p>Established a clinic day focused on EPI vaccines at Tarakan District General Hospital and got hospital administrators buy-in to perform immunizations at the hospital for infants</p> <p>Successfully advocated to the MOH to continue national MR vaccine program, requiring MR vaccine in children, after the official campaign ended with the National Commission on Post-Immunization Accidents to sustain immunization coverage of MR</p> <p>Achieved 100% immunization rate for basic vaccines (increase from 60%) and 97.1% MR immunization rate (increase from 40%) in Way Kanan district</p>
Strengthened institutional capacity for advocacy and immunization systems support	<p>Developed an internal system to implement immunization advocacy initiatives through advocacy champions and 33 chapters</p> <p>71.4% of IPS trained immunization champions who completed the online survey feel very to extremely confident in their skills as an advocate</p> <p>71.4% of IPS trained immunization champions who completed the online survey stated that IPS has contacted them regarding the advocacy strategy created during the initial training</p> <p>57.1% of IPS trained immunization champions who completed the online survey feel very confident that IPS is addressing the immunization challenges they see in their daily work</p> <p>100% of IPS trained immunization champions feel that advocating for immunizations is very to extremely important to them professionally</p>

### Access to services

In Jakarta, most immunizations are administered by private providers; however, unlike the public sector, these immunizations are usually only available through individual appointments with providers. As a result of the IPS advocacy training, IPS Immunization Champions at several private hospitals in Jakarta developed dedicated immunization clinics for their hospitals, thereby improving demand for and access to immunization among each facility's patient population. While the case study did not assess the direct result of coverage for these patients, improvements in coverage were self-reported by hospital staff. Nonetheless, there is a clear link to training private-sector pediatricians on the importance of immunizations and their ability to impact how services are accessed within their own clinical settings.

At the national level, as a result of IPS advocacy, the MOH will be incorporating the MR vaccine into the package of basic vaccines offered through the national immunization program. Previously, the vaccine was only offered through SIAs or upon request at a charge to families.

### Increased immunization coverage

Immunization coverage is particularly poor in rural districts of Indonesia. This is due to a myriad of issues including vaccine supply, vaccine hesitancy, and access to trained vaccine providers. In Way Kanan, during the 1-y mandatory deployment of the vaccine advocacy trained "fresh graduate" pediatrician, the

"fresh graduate" worked with the Way Kanan Health Office to improve immunization access and stakeholder knowledge of immunizations at all levels (e.g. all public health providers, government, and parents within the district). This resulted in immunization coverage rates increasing from 64.8% in January 2017 to an average of 100% in December 2018. As of April 2019, when follow-up data were collected, the immunization coverage rates remained at 100%. Similarly, MR coverage (which was not offered in the basic package of vaccines prior to Spring 2019) increased from 40% in January 2018 to 97.1% in December 2018 (coverage data are based on monthly reports submitted to the Way Kanan Public Health Office Data Center). According to District Health officials, this coverage increase is attributed to the on-the-job training and reporting and data management support the "fresh graduate" provided to both the District Health office team and the Indonesian Ulema Council delegation for Way Kanan (Majelis Ulama Indonesia), which serves as the official interface between the Indonesian government and the Islamic community.

### Strengthened institutional capacity for advocacy and immunization systems support

#### Organizational commitment to immunization advocacy

Through technical assistance and partnership engagement, IPS has evolved to be a key partner in Indonesia's immunization program. This is most clearly illustrated by the receipt of an

MOH award naming the IPS president as the most preeminent person in the immunization program during 2018.

Prior to the project, IPS had strong communications with their membership. Throughout the past 3 y, IPS has expanded their activities to reach all areas of the country and focus on needs identified by immunization partners (engagement in the 2018 MR SIA) and the MOH (coordination of private-sector immunization data). IPS is now regarded as a key resource for immunization information among clinicians and private providers, as evidenced by the formal partnerships that have been established between GPs, nurses, midwives, as well as the ongoing supportive supervision and clinical education IPS provides.

### *Ongoing support for membership engagement in immunization issues*

IPS developed several training curricula to support the clinical and advocacy skills of their members, including basic vaccinology for medical students; vaccine advocacy and communications; and I-POINTS data reporting and associated provider tools. Across all 33 chapters, IPS has trained over 400 pediatricians (about 10% of their membership). However, the majority of these members are based in Java. While the number of members trained is modest, 71% of the Champions surveyed feel very confident in their skills as an advocate (as compared to 56% at baseline) and 71% reported feeling engaged and supported by IPS in their advocacy activities.

### **Discussion**

Although IPS has had great success, there have been four main challenges to ensuring that their work is sustainable: (1) varying needs and commitments due to the vast geography and high level of decentralization in Indonesia; (2) bureaucratic turnover in national and sub-national immunization programs; (3) long-term commitment to data collection and regular reporting; and (4) community vaccine hesitancy.

Vast and varying needs across geographies: Indonesia is a country with more than 6,000 inhabited islands, 6 acknowledged religions, with Islam as the majority religion, and a population greater than 250 million with projections to reach 320 million in 2045. Each year, the birth cohort is approximately 4.5 million.<sup>9</sup> Both the geographic and demographic makeup of the country creates a wide variety of challenges for the Indonesia health-care system, especially for pediatric care.<sup>13</sup> Even though the central government procures and distributes vaccines, service delivery and coverage vary greatly across provinces and districts as a result of management capacity and local needs and cultures. For example, during the second phase of the 2018 MR campaign for children outside Java island, the coverage of children on other islands reached only 68% compared to 98% in Java.<sup>14,15</sup> In Aceh, a province that follows Sharia law, the coverage was only 8%<sup>16</sup> illustrating how certain religious and cultural beliefs can impact uptake.

Bureaucratic turnover: Establishing relationships with partner government officials in the MOH has been affected by inevitable staff turnover. When new ministers and other officials are elected or bureaucrats change positions, the relationship-building process must start over, and this slows down progress. Additionally, priorities of the government may

change when the new officials come into the office. This was particularly the case for the perceived importance of private-sector engagement in the public system.

Long-term commitment to data collection: Many providers expressed concern with the time needed to input data into the I-POINTS reporting system. There are currently no incentives or mandates requiring that private providers report services provided, so there is a risk of these providers ceasing to report services if they feel the burden is too great. Typically, pediatricians in Indonesia work 80 to 120 h a week at multiple hospitals. Additionally, IPS has not been able to analyze the data to show improvements in coverage, which may act as a deterrent for some providers. Without incentives and already high workloads, I-POINTS could add to physician burnout.

Vaccine hesitancy: Decision-making processes regarding vaccination are complex and multifaceted. Many providers cited vaccine hesitancy, namely related to perceived religious restrictions and adverse reactions to vaccines, as major barriers to achieving immunization goals. Additionally, Indonesia's recent experience with counterfeit vaccines, which sparked public outrage and provider arrests and an Islamic fatwa against the MR vaccine, has eroded public trust that must be rebuilt. Combatting hesitancy is complex and requires a multi-pronged approach including coordination of the public and private sectors. Ongoing support to providers, immunization partners, religious organizations, and the community is needed.

To ensure there is sustained coordinated immunization data between public and private sectors; improved service delivery; and national pediatric society capacity strengthening, IPS plans to:

- (1) Continue to expand the cohort of IPS immunization champions in order to advocate for immunization priorities and increase reporting of private-sector data through the I-POINTS system;
- (2) Ensure all champions have access to the immunization advocacy handbook;
- (3) Continue to train recent pediatric "fresh graduates" in immunization data collection and mentorship during pre-departure training for the mandatory year of service;
- (4) Incorporate training into residency programs by collaborating with IPS Developmental Behavioral and Social Pediatrics Working Group to submit to the Indonesian College of Pediatrics. Changes in pediatric postgraduate training curricula need to be approved by Indonesian College of Pediatrics during the National Pediatrics Congress in 2020;
- (5) Continue to collaborate with Indonesian Medical Association and Indonesian Midwives Association and identify opportunities to implement IPS' data collection system amongst other private providers administering vaccines;
- (6) Develop a reporting protocol for private practitioners and the MOH for quality assurance and advocacy related to immunization service delivery;
- (7) Analyze the data collected by the I-POINTS system to be used by MOH and NITAG;

- (8) Link the I-POINTS system to the MOH's immunization reporting system;
- (9) Regularly sharing experience session and discussion with IPS and trained fresh graduate pediatrician who have worked in immunization program;
- (10) Collaborate with Uelama to support and increase immunization coverage and minimize vaccine hesitancy.

Furthermore, as a part of a larger set of projects led by AAP, with support from CDC, aimed at building capacity of national pediatric societies to strengthen national health systems and immunization programs in multiple countries, some findings based on the knowledge of each project implementation and the in-depth analysis of Indonesia, several findings may be transferable across specific national immunization program and country needs:

- (1) Collaboration with and training of non-traditional stakeholders across the health system – particularly professional medical associations – may be paramount to increasing and sustaining improved immunization coverage;
- (2) Due to bureaucratic turnover, establishing long-term relationships with key stakeholders may be difficult but is critical to regional and national-level prioritization and policy changes;
- (3) Pediatricians often work in both the private and public sectors and can be a natural point for coordination of data, messaging and services but require specific outreach from ministries of health and bilateral organizations to ensure engagement;
- (4) Engagement and buy-in from community and religious leaders of messaging and outreach is often essential to improved service delivery and declines in vaccine hesitancy;
- (5) Continued opportunities to increase the knowledge basis of providers regarding both immunization standards and advocacy skills is highly desired and critical to sustainably addressing immunization challenges, particularly around demand.

Because of the detailed and in-depth nature of the study approach and its setting in the reality of the Indonesian context, one limitation of the study is the extent to which the results may be generalized. Additionally, sample sizes for both the web-based surveys and in-person interviews were relatively small – the survey data were collected from seven individuals and the interviews were limited to health-care workers and stakeholders in three locations across the country. Also, as interviews were retrospective in nature findings are limited to participant perceptions of how things have changed rather than absolute-value change.

## Conclusion

In conclusion, building the capacity of National Pediatric Societies (e.g., IPS) through education empowers individual members, and other child health clinicians to strategically advocate for improved immunization services across both public and private sectors

enable them to play a unique role in helping countries reach global immunization targets. As clinicians, advisors, educators, and advocates, they have the ability to strengthen immunization systems from multi-levels and the potential to sustain improvements. The collaboration between stakeholders (e.g., national pediatric societies, ministry of health, religious and community leaders) is pivotal. This will all work to significantly benefit the health of the infants and children in the country and, in the long term, could be imitable to other low-middle income countries.

## Disclosure of potential conflicts of interest

This is to declare that there is no conflict of interest, both financial and non-financial with any organizations or institutions.

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