



The Role of Nurses in Immunisation

A SNAPSHOT FROM OECD COUNTRIES

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Executive Summary

Introduction

Immunisation is one of the safest and most cost-effective health and public health interventions available that has a powerful impact on health outcomes (WHO, 2018; US Dept of Health and Human Services, 2015; Koslap-Petraco, 2013; IOM, 2013). Immunisation is an essential element of health promotion throughout the life-cycle (IFA, 2017). However, in the US alone, in 2015 there were 14.1 million cases of vaccine-preventable diseases attributed to unvaccinated adults (Lam & Goad, 2017). Globally, there is currently less focus on adult immunisation resulting in a global burden of vaccine-preventable illness (WHO, 2016; Woodward, 2016). Many new vaccines are under development to tackle some of the world's most deadly communicable diseases such as Ebola and Malaria. Yet currently globally only 1 in 5 girls aged 15 years lives in a country in which HPV is in the national immunisation schedule (World Health Organization and UNICEF, 2017).

Research has shown that lack of recommendation by a health professional is one of the main barriers to adult immunisation (Lam & Goad, 2017). The ICN Immunisation Project is predicated on the assumption and evidence that Registered Nurses (RN) and Advanced Practice Nurses (APN) can and should play an important and significant role in primary health care and health promotion, and that a strategic focus on nurses' full involvement in immunisation can advance the goal of immunisation for all across the life cycle (ICN, 2013). This basic premise has fuelled the International Council of Nurses' (ICN) focus on global immunisation. ICN recognised a need to better understand nurses' engagement in immunisation activities including: education, management, administration, prescription and policy and programme development. Pfizer's department of Global Patient Affairs / Healthy Ageing Center of Excellence has provided support for this project.

Survey to Determine Nursing's Involvement in Immunisation

In collaboration with the National Nursing Associations (NNA), 15 of the 36 OECD (Office of Economic Cooperation and Development) countries were invited to participate in a survey to determine the current state of nursing's involvement in immunisation in their countries, fifteen countries responded. The survey consisted of five key areas reflecting: 1) nursing's overall role in, and preparation for immunisation interventions; 2) prescribing immunisation; 3) administering vaccination; 4) activities related to expanding nursing's role in immunisation; and 5) respondent information. In addition, further analysis was carried out to determine the degree of nurse immunisation role engagement by country.

Key Findings Related to Nurses' Role in Immunisation in OECD Countries Surveyed

1. Countries surveyed generally presented as excelling, expanding or emerging in relation to degree of nurse immunisation role engagement. Of the 15 participating countries, three (20%) were identified as excelling, eight (53%) as expanding and four (27%) as emerging in relation to nurse immunisation role engagement.
 2. Advanced Practice Nurses (APNs) and Registered Nurses (RNs) are highly engaged in immunisation activities in OECD countries, with potential for a more extensive nursing role in: education related to immunisation, immunisation prescribing and policy and programme development activities. Licensed Practical Nurses (LPNs) play a minimal role in the practice of immunisation in most countries surveyed.
 3. APNs and RNs are well prepared to carry out key immunisation interventions ranging from immunisation awareness raising, education, vaccine administration, prescribing and policy development. There is room for enhancement, especially to support RNs' health teaching, prescribing and policy related roles.
 4. Prescribing is the largest barrier to nurses' increased involvement in immunisation.
 5. Vaccination prescribing is an emerging role for both APNs and RNs, while vaccination administration is gaining full acceptance as a consistent aspect of nursing's role in immunisation in all jurisdictions.
 6. Considerable work by nursing associations is targeted to influencing the enhancement of the role of the nurse in immunisation, largely in activities related to RN and to a lesser extent APN prescribing, and RN vaccination administration.
 7. There appears to be support for APN and, to a lesser extent, RN prescribing from key policy and regulatory stakeholders, nurses themselves and some physicians.
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The results of the immunisation survey of 15 OECD countries, provide a profile of nurses' role in immunisation and can be used to shape further action in this area. Such action should focus on reinforcing and expanding nurses' contribution to immunisation through support for more involvement in immunisation education, and in immunisation programme and policy development. In addition, advocating for nurse prescribing and addressing the major barriers to nurses working to full potential in immunisation, requirement for a prescription to immunise, time for immunisation interventions in the work schedule, and necessary enabling legislation would have a marked effect on nursing's ability to impact immunisation rates.

Countries excelling in nurse immunisation role engagement were those in which nurses were:

1. very likely to promote and support immunisation
2. involved and prepared in all aspects of immunisation- education, managing vaccination, vaccine administration and prescription, and advisory roles
3. successful in overcoming key barriers to full engagement in immunisation activities such as requirement for prescription and other individual, system and organisational barriers

4. supported to prescribe immunisations, particularly the RN and APN roles and the National Nursing Association was engaged in expanding the role of nurses in prescribing, and enhancing their role in immunisation.

Report

1. Introduction and Overview

Tackling pervasive and preventable chronic and long-term health issues is one of the key goals of strategic planning related to global health (WHO, 2015; WHO, 2013; ICN, 2009). Evidence-based health promotion, with a focus on policy and programmes that maximize health, human resources and facilitate populations to make healthy life style choices and control their own health, is seen as a powerful approach to shifting the health care focus from illness to health and wellness (ICN, 2009). Health promotion and primary illness prevention are cornerstones of primary health care. Nurses, with their wide spans of care across all settings and sectors, comprehensive education base including the social determinants of health, and high levels of public trust, can be effective agents of this health system transformation to population-based primary health care (Tomblin-Murphy & Elliott Rose, n.d.).

As part of this transformation, it is clear that more attention needs to be paid to immunisation as one of safest and most cost-effective health and public health interventions available that has a powerful impact on health outcomes (WHO, 2018; US Dept of Health and Human Services, 2015; Koslap-Petraco, 2013; IOM, 2013). While immunisation is an essential element of health promotion throughout the life-cycle (IFA, 2017), there is currently less focus on adult immunisation globally; in the US alone, in 2015, there were 14.1 million cases of vaccine-preventable diseases attributed to unvaccinated adults (Lam & Goad, 2017). Globally, there is currently less focus on adult immunisation resulting in a global burden of vaccine-preventable illness (WHO, 2016; Woodward, 2016). Certainly, with children, immunisation has all but eradicated a number of diseases over the years; some that have debilitating effects such as polio, and other incapacitating diseases, including small pox and measles.

In the OECD, there is little data available on the broad range of vaccinations, however, in 2017, the OECD reported influenza vaccination rates across all countries. There was great variability with Korea identified as having the highest rate with 84.4% of adults over 65 years being immunised (OECD, 2018). For further details, please refer to Table 1 on the following page.

Childhood vaccination rates are much higher across the OECD, with the majority of countries above 90% for the recommended schedule - diphtheria, tetanus, pertussis / measles (OECD, 2018). For further details, please refer to Table 2 on the following pages.

Successful immunisation programmes, however, have a downside in that the public, on seeing no evidence of such diseases, may lose sight of the fact that sustained immunisation programmes are necessary to keep communicable diseases at bay (Koslap-Petraco, 2013; Camargo & Grant, 2015). Moreover, despite the fact that immunisation is a public health success story, there is also declining interest in immunisation in the developed world, due to concern about adverse events which are sensationally reported in the media despite a very small incidence of serious side effects or allergic reaction and are minimal and limited relative to those for health care interventions in general (Wang, 2014; IOM, 2013).

In low and middle income countries, immunisation rates are influenced by restricted or no access to safe immunisations, increasing the disease and economic burden for both children and adults. Furthermore, such issues as unreliable cold chain, unsterile technique, inadequate storage of vaccine, and insufficient supplies and expertise to advise about and administer vaccines have meant that this strong component of health care is not having the impact it could, resulting in negative health and economic outcomes (ICN, 2013).

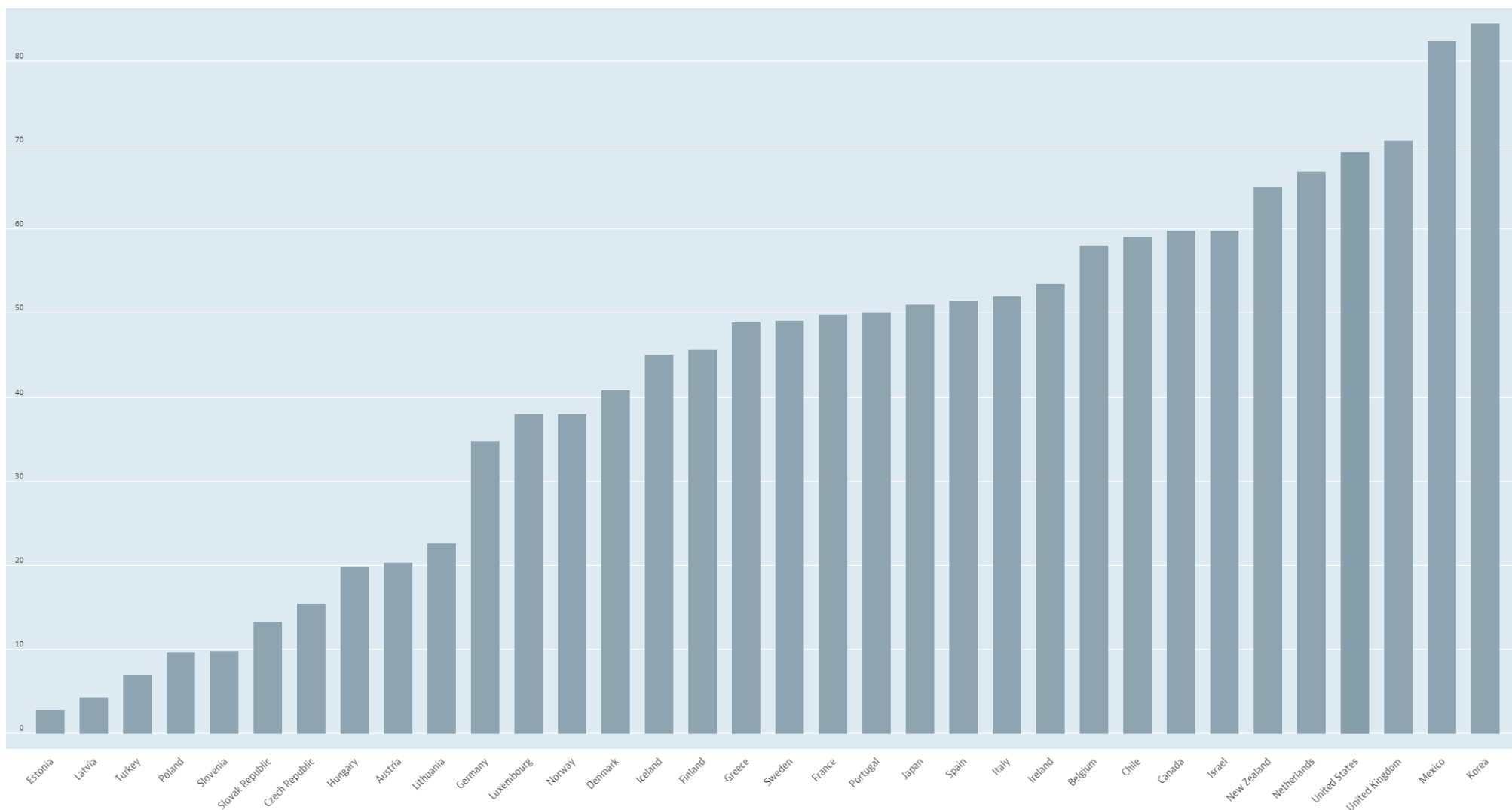


Table 1 - OECD (2018), Influenza vaccination rates (indicator). doi: 10.1787/e452582e-en (Accessed on 09 October 2018)

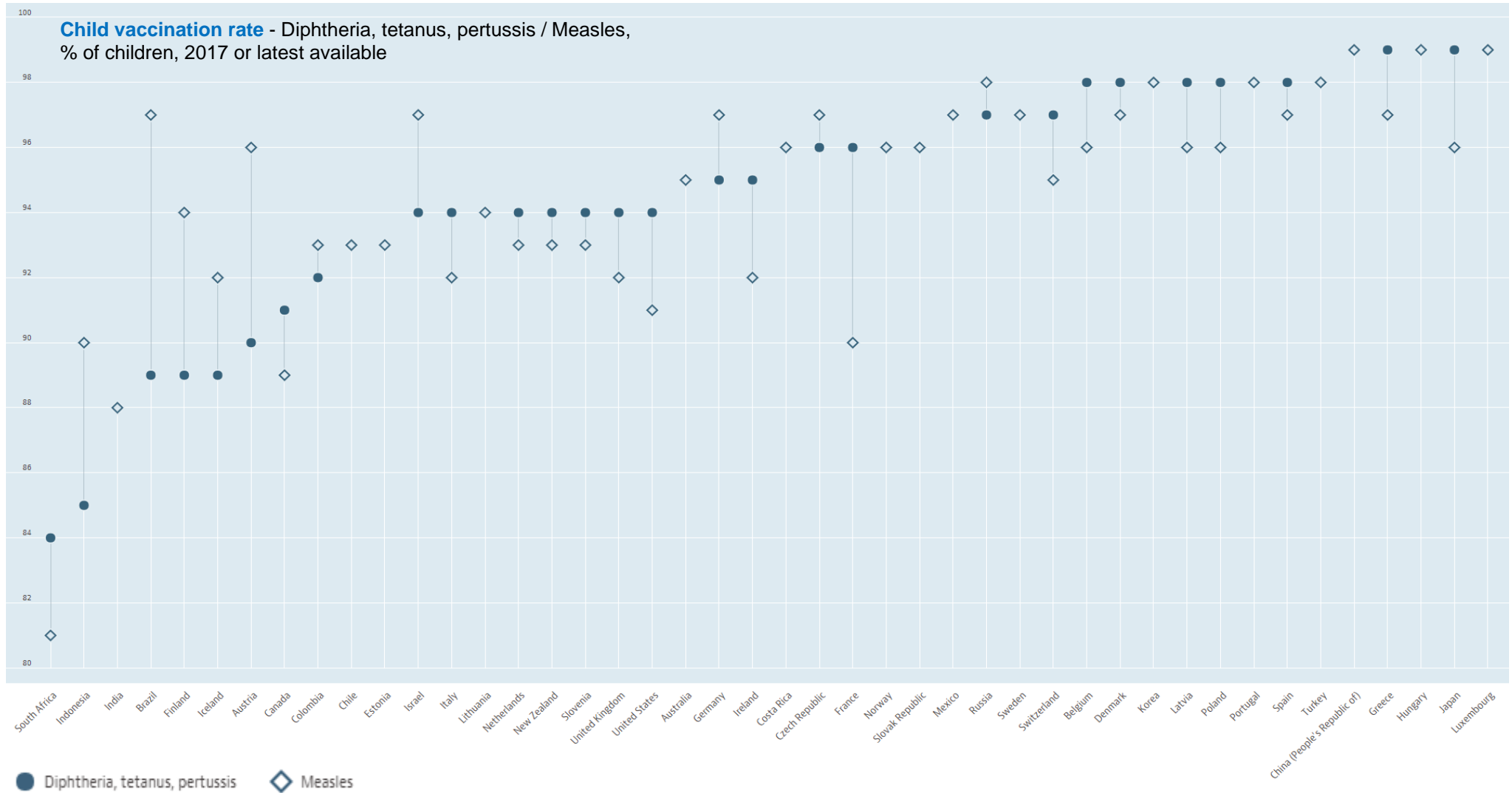


Table 2 - OECD (2018), Child vaccination rates (indicator). doi: 10.1787/b23c7d13-en (Accessed on 09 October 2018)

2. The International Council of Nurses and the Role of Nurses in Immunisation

As part of its call for nurses' greater involvement in both health promotion and primary health care, ICN has long advocated that nurses can and do play a critical role in immunisation the world over. In fact, some parts of the world rely solely on nurses to manage their immunisation programmes, including training and supervision of other health care workers to administer vaccination (ICN, 2013). However, there is more to be done and today, since 1 in 10 infants did not receive any vaccines in 2016, with the proportion of children who receive recommended vaccines not increasing since then, and since adult vaccination is highly underutilized (WHO, 2018), it is clear that nurses and other health care professionals must pay more attention to immunisation as a public health intervention. Indeed, given nursing's current involvement in all aspects of immunisation, its extensive presence across health care sectors, and high public trust, ICN believes that increasing and enhancing the engagement of nurses in the full spectrum of immunisation activities (ICN, 2013), as part of their expanding role in primary health care, is a key strategy for improving global immunisation rates.

This spectrum of immunisation activities includes: awareness raising and public advocacy related to the importance of immunisation; active health education; dispelling myths; assisting individuals in the management of their immunisation schedules; administering vaccinations; prescribing vaccinations; overseeing vaccination programmes; supervising others on the immunisation team; and advising on immunisation programmes and strategies. Nurses are involved in all of these activities, to a greater or lesser extent in countries around the world (ICN, 2013) and have a critical role to play in increasing immunisation reach.

It is ICN's position that nursing can influence vaccination rates globally and, as such, has developed a comprehensive immunisation strategy (ICN, 2016). However, just as the public has become complacent about immunisation given its apparent simplicity, focus on prevention and high publicity of adverse events, so too in some cases has nursing. With so many other high tech and complex interventions that make up nursing's knowledge and skill set, immunisation in some contexts is not given the attention it deserves as one of the most cost effective and successful interventions in the world.

3. Understanding the Current State of Nursing's Involvement in Immunisation

One of the first steps in enhancing nursing's involvement is to determine what role nurses are currently playing in immunisation; what are the barriers to nurses' increased involvement in immunisation; and what are potential areas for growth. To this end, in 2018, ICN renewed its partnership agreement with Pfizer in order to commence work in realizing its broad immunisation strategy, through implementation of a survey to determine the "current state" related to nursing and immunisation. The aims of the survey were to:

1. highlight the role that nurses play in advocating for recommended immunisation in their country
2. determine the clinical and leadership responsibilities nurses have related to immunisation
3. identify nurses' involvement in increasing rates of vaccine delivery, and influencing population confidence in immunisation and,
4. discover existing barriers to nursing's involvement in immunisation.

3.1 Development of a Current State Survey

The survey was developed with input from both ICN and the Pfizer immunisation teams. At the outset, it was determined that the target would be a representative group of countries reflecting various levels of engagement in immunisation activities, and able to complete the survey on line. The survey was based on the conceptualization of immunisation involving a continuum of activities including advocacy, health education, helping individuals self-manage immunisation, administering vaccination, prescribing vaccination and advising at the programme and policy levels. The survey consisted of 19 questions (See Appendix A) addressing five key areas: role of the nurse in advocacy for immunisation; role of the nurse in prescribing vaccinations; role of the nurse in administering vaccinations; expanding the role of the nurse in immunisation; and respondent details.

The key areas of focus for the survey, survey questions, target group of participants, and overall time lines were determined during a planning meeting of Pfizer and ICN immunisation team members in February 2018. A consensus approach was used to agree on the survey goals, content areas and related questions, and timelines. The target countries were selected based on knowledge of degree of involvement in immunisation, ability to access the survey on line, engagement in ICN, and where possible, attention to regional spread.

3.2 Survey Methodology

The survey was completed by June 2018. In an effort to obtain input from each of the target countries, surveys were sent to the country's National Nursing Association (NNA) and in addition, each NNA was asked to forward the survey to the regulatory body and/or the chief nursing focal point in their country. This ensured that at least one of the target participants answered the survey.

The survey was distributed through email from ICN, and participants had a two-week time frame for completion. Due to need for translation in several of the countries, upcoming ICN meetings, and requests for more information, the survey deadline was extended several times in the interest of facilitating countries to be able to provide their data.

In an additional attempt to increase participation, the ICN/Pfizer Immunisation Project was discussed with the target NNAs in attendance at the ICN National Nursing Associations Meeting (17 May 2018), and at this meeting, target countries could complete the survey in hard copy and submit it to a member of the ICN immunisation team. Finally, special attention was given to six countries in an effort to accommodate contextual issues requiring more time and/or information.

3.3 Data analysis methodology

Dr Timothy Skinner BSc, MTEM, PhD, Professor of Health Psychology, performed a data comparison analysis. The methodology used is as follows: data from the questionnaire were linked with the most recent influenza vaccination rates for people over 65, as reported at OECD Influenza vaccination rates (OECD, 2018) with analysis undertaken using SPSS V24. The degree of nursing preparedness was calculated by summing responses to the seven items for each nursing group, and creating a mean item response, where 0 equates to not being prepared and 3 to being well prepared. Responses to the items asking about nurses being authorised to prescribe vaccines were summed across the three nursing roles. The correlations between preparedness and vaccination rate were tested using Kendall Tau coefficient, due to substantial difference in the range of data. Differences between prescribing and non-prescribing countries were tested using a simple independent t-test.

4. Results

4.1 Description of Survey Respondents

In all, 15 countries completed the survey. The majority, just over 60% of respondents, were the National Nursing Associations, which is not surprising since they were the initial target. Other responses came from the Country Government Chief Nurse (18.8%) and the remainder (18.8%) from the nursing regulatory body and a regional nursing organisation. For the most part, participating organisations indicated they had up to date information in this area, and that their responses were mostly, to very, representative of the country. Three countries said their responses were somewhat representative since there was variation across regions.

By and large, respondents indicated they (as nursing organisations and stakeholders) were highly engaged or engaged in enhancing the role of nurses, in general, in immunisation related to the continuum of immunisation activities listed below, in order of degree of stated engagement:

1. Provide evidence-based immunisation information to patients (benefits, risks, common myths) - 100% (15 countries) Note this activity does not involve active teaching but rather making information available.
2. Educate individuals and provide advice on vaccination (raise awareness about benefits and risks, discuss common myths) - 93% (14 countries)
3. Serve on immunisation advisory committees - 86% (13 countries)
4. Determine individual's immunisation status, and/or provide reminders regarding vaccination due dates - 53% (8 countries)
5. Proactively identify individuals for appropriate immunisation - 46% (7 countries)
6. Administer vaccinations to patients and/or persons in the community - 46% (7 countries)
7. Prescribe the administration of vaccines - 33% (5 countries)

4.2 Nurses' Overall Involvement in Immunisation Interventions and Degree of Preparation

Involvement in immunisation interventions – The results affirm that nurses are very engaged in immunisation activities, and that providing immunisation information, and actively teaching about immunisation are key parts of the nursing role. Table 3 displays how many countries indicated APNs and RNs were most likely to be involved in key interventions across the immunisation continuum. It also shows that RNs are more engaged than APNs in education related to immunisation, proactively identifying need for immunisation, and in administering vaccines. No immunisation intervention specifically addressed assessment as it was assumed to be part of each of the interventions. Since RNs play a greater role in administering vaccines, they are more likely to engage in teaching, and proactively identifying need for vaccination.

Involvement in immunisation intervention for APNs and RNs

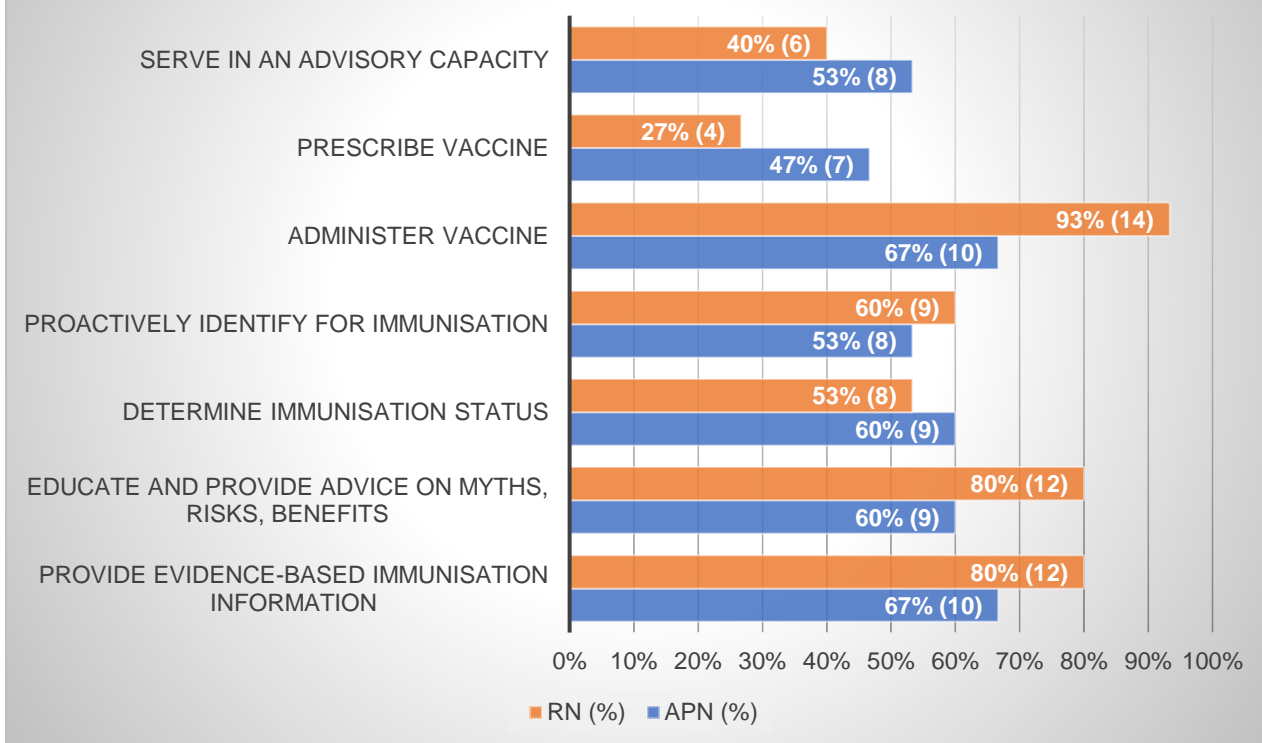


Table 3 - Involvement in immunisation intervention for APNs and RNs

The numbers represent the positive responses received out of the 15 countries that took part in the survey

Table 3 highlights some areas for attention in supporting both APNs and RNs to work to full potential such as: immunisation education; determining immunisation status; proactively identifying individuals for immunisation; serving in an advisory capacity; and prescribing vaccinations. Important first steps in increasing immunisation interventions among nurses may include addressing the identified barriers to nurses' greater involvement in immunisation:

- requirement for prescription
- lack of time and lack of legislation, as well as
- the need for knowledge and information.

The countries that did not identify APNs as most likely to engage in these immunisation activities indicated this was not applicable, a response that could mean the APN role is not fully developed in the country, the focus of immunisation for the APN is more targeted to the population level, or these immunisation interventions are not fully embraced as part of the APN role.

Preparation for Immunisation Roles – APNs were seen by the majority of countries as adequately to well-prepared for immunisation education and vaccine administration activities, with marginally fewer countries indicating they were well prepared in proactively identifying individuals for immunisation. Only approximately half of the countries indicated APNs were well to adequately prepared for serving in an immunisation advisory capacity and for prescribing vaccinations. Both the advisory and prescribing roles are emerging roles for nurses and concerted attention may need to be paid to education and support to increase preparedness.

RNs were seen as adequately to well prepared to administer vaccines by all of the responding countries, however, somewhat fewer countries indicated this level of preparedness regarding immunisation roles related to education, providing evidence-based immunisation information and determining individual’s immunisation status. Issues such as time and legislation may impact how often nurses are engaged in these roles and their perceived preparedness. The health educator role of the RN in some cases has increasingly been eroded given the multiple demands on nurses’ time in most sectors, which could also be a factor here.

RNs were seen to be least prepared to proactively identifying individuals for immunisation, prescribe vaccination and to serve in an advisory capacity related to immunisation. The fact that in most countries RNs do not prescribe or this is an emerging role could certainly impact perceptions of RN’s preparedness for these interventions.

Barriers to Nurses’ Involvement in Immunisation – Table 4 outlines the extent to which specific individual, organisational or system factors are seen as barriers to nurses’ engagement in immunisation.

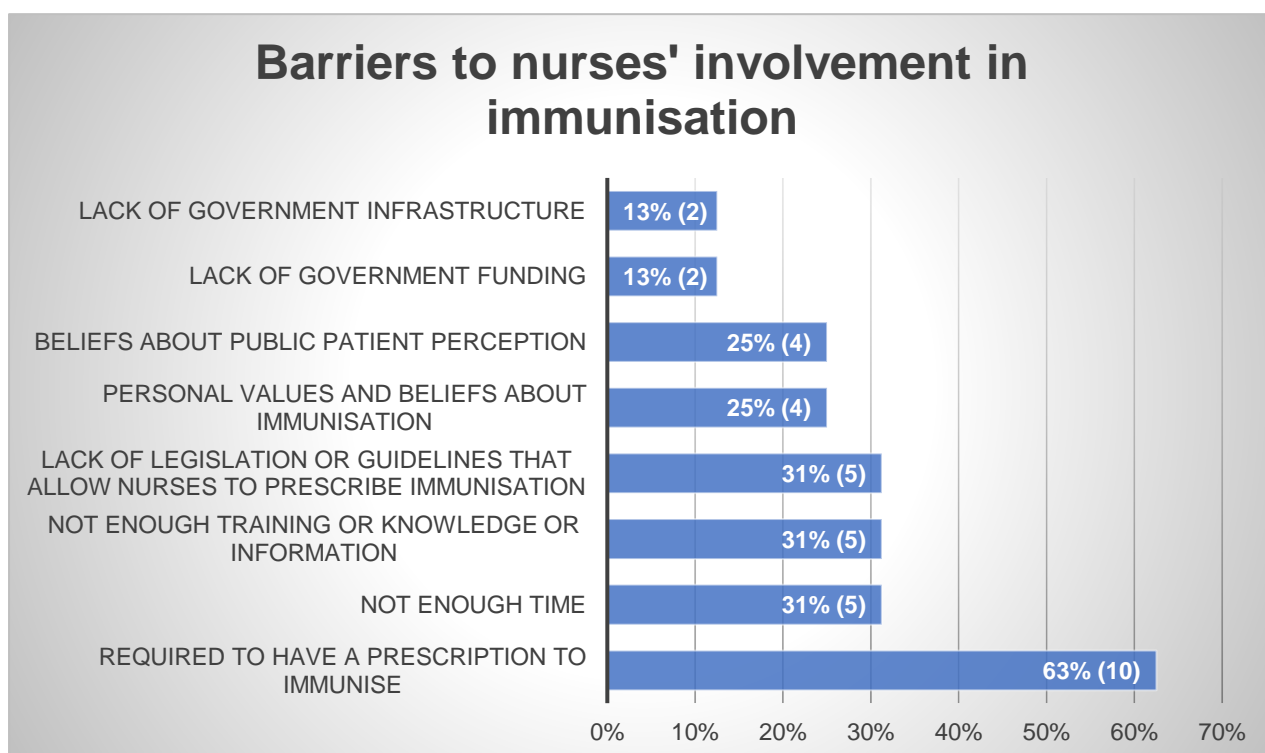


Table 4 - Barriers to nurses' involvement in immunisation

The numbers represent the countries that identified the factor as being a barrier to a great or moderate extent, out of the 15 countries that took part in the survey

As represented in Table 4, nine out of the 15 countries (60% of respondents) selected “required to have a prescription to immunise” as the greatest barrier. No other factors were so clearly identified as barriers, however, the other barriers identified are of interest in that they relate to organisation and system factors such as workload and legislation that, if addressed, could support nurses in immunisation roles. In addition, the barriers related to training, knowledge and information; personal perceptions about immunisation; and beliefs about the public’s receptiveness to

immunisation may all signal the need for more attention to ongoing immunisation education and training for nurses.

Key Findings

APNs and RNs are highly engaged in immunisation activities in OECD countries with potential for a more extensive nursing role in: immunisation education, immunisation prescribing and policy development activities. LPNs play a minimal role in the practice of immunisation in most countries.

APNs and RNs are seen as well prepared to carry out a number of key immunisation interventions ranging from immunisation awareness raising, immunisation education, vaccine administration, prescribing and policy development. There is room for enhancement, especially to support RN health teaching, prescribing and policy related roles.

“Required to have a prescription for immunisation” is noted as the largest barrier to nurses’ increased involvement in immunisation while other barriers relate to system, organisation and such as workload, legislation, education/knowledge/training, personal perceptions about immunisation, and beliefs about the public’s receptiveness to immunisation.

4.3 Nurses’ Role in Prescribing Vaccination

Authorization to Prescribe – Authorization to prescribe is progressing in both the APN and RN categories. Five countries indicated APNs could prescribe and one country said regulatory changes were in process to enable prescribing. Whereas three countries indicated RNs were authorized to prescribe, four countries noted regulatory changes were in place to authorize prescribing. This welcome addition to nurses’ scope of practice could enable nurses to address the key barrier of requirement for prescription for immunisation which seems to be prevalent in many countries.

Education/Training to Support Prescribing of Vaccination – When respondents were asked about additional requirements in order for APNs and RNs to prescribe vaccinations, experience in specific areas of practice and a specific educational requirement such as a course were most frequently identified. Hours of supervised practice and access to a mentor were less common requirements.

Authorizing Bodies – The Ministry of Health appears to be the key body responsible for authorizing nurses to prescribe, however, in seven countries the nursing regulatory body was also identified in this role, perhaps signalling nursing’s increasing health system contribution to regulation and policy.

Stakeholder Support for Nurse Prescribing – Table 5 outlines the degree of support by key stakeholders for APNs and RNs prescribing.

Stakeholder support for nurse prescribing

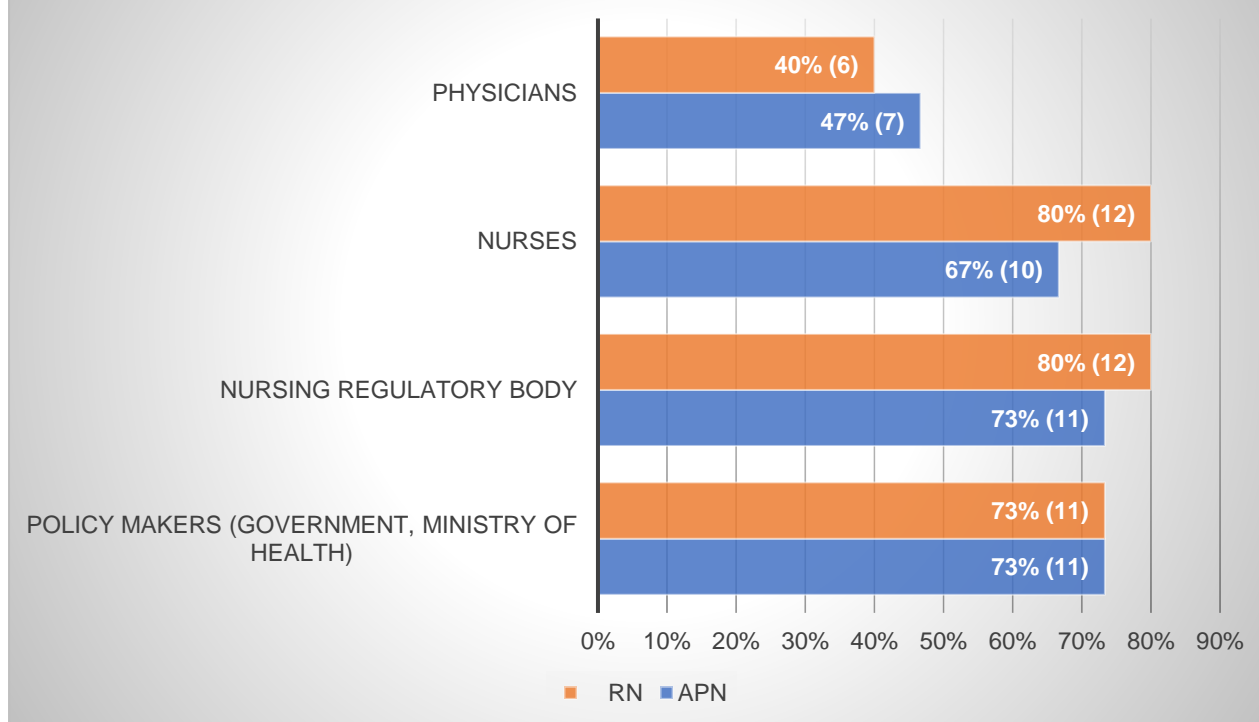


Table 5 - Stakeholder support for nurse prescribing

The numbers represent the countries identifying high to medium stakeholder support for nurse prescribing by category, out of the 15 countries that took part in the survey

The responses indicated in Table 5 are encouraging for both APNs and RNs prescribing, with policymakers, the nursing regulatory body, nurses themselves and, in some cases, physicians perceived as offering high to medium support.

Key Findings

Vaccination prescribing is an emerging role for both APNs and RNs and there appears to be support for APN and to a lesser extent RN prescribing from key policy and regulatory stakeholders, nurses themselves and some physicians.

4.4 Nurses' Role in Administering Vaccination

Administration of Vaccination and Education/Training – Close to 100% (14 countries) of all responding countries indicated that RNs administer vaccination to a broad range of patients/persons across all sectors. It is noteworthy that countries identified RNs as more highly involved in vaccination administration than APNs, which may mean APNs have more focus on immunisation prescribing, monitoring and follow up at the population level, or are more available for these roles. In light of this finding, and given the reach of RNs around the world, concerted efforts in enabling other aspects of immunisation interventions through enhancing nursing immunisation education, ensuring adequate time for immunisation interventions and approving enabling legislation could bolster this role in nursing and greatly impact immunisation rates.

In over 81% of the responding countries, administering vaccination is included in the basic RN nursing curriculum, however, in many cases continuing education and on the job skill building were

also identified as required types of education, perhaps as a way of keeping updated and competent in the intervention.

Key Findings

APNs and RNs are highly involved in administration of vaccinations with only one country indicating RNs did not administer vaccines and enabling policy change was in process.

4.5 Expanding Nurses' Role in Immunisation

Work is being carried out across 10 countries (over 62% of respondents) to expand the role of the nurse (all categories) in immunisation through involvement in key activities such as:

- Lobbying for policy change re nurse prescribing, and vaccination administration
- Development of regulations and guidelines re nurse prescribing and vaccination administration
- Advocacy for inclusion of nurse prescribing and vaccination administration in nursing education programmes
- Promotion of certification programmes for vaccine administration

Only three countries indicated there was no activity in these areas, and two countries were not aware of the activities being carried out. The lack of focus in these areas in some countries may mean these roles are already in place with appropriate guidelines and legislative support. This finding regarding the active work in immunisation roles for nurses, provides a context ripe for further discussion by ICN related to maximizing nursing's involvement in immunisation through education, legislation and regulation.

Out of those 10 countries (over 62%), Table 6 depicts the number of countries engaged in activities to expand the role of the nurse in immunisation by category of nurse, more activity in the OECD countries is focused on the RN rather than on the APN category. Since more countries indicated APNs have prescriptive authority compared to RNs (five countries versus three), and vaccination administration seems to be more of a focus for RNs than APNs, this finding is not surprising. However, given the large number of RNs, compared to APNs, such activities may more rapidly impact nursing's increased involvement in immunisation and overall immunisation rates. It also positions the APN role to focus more on population health, overall immunisation programmes and strategies, evaluation and policy.

Activity by Organised Nursing to Expand the Role of the Nurse in Immunisation

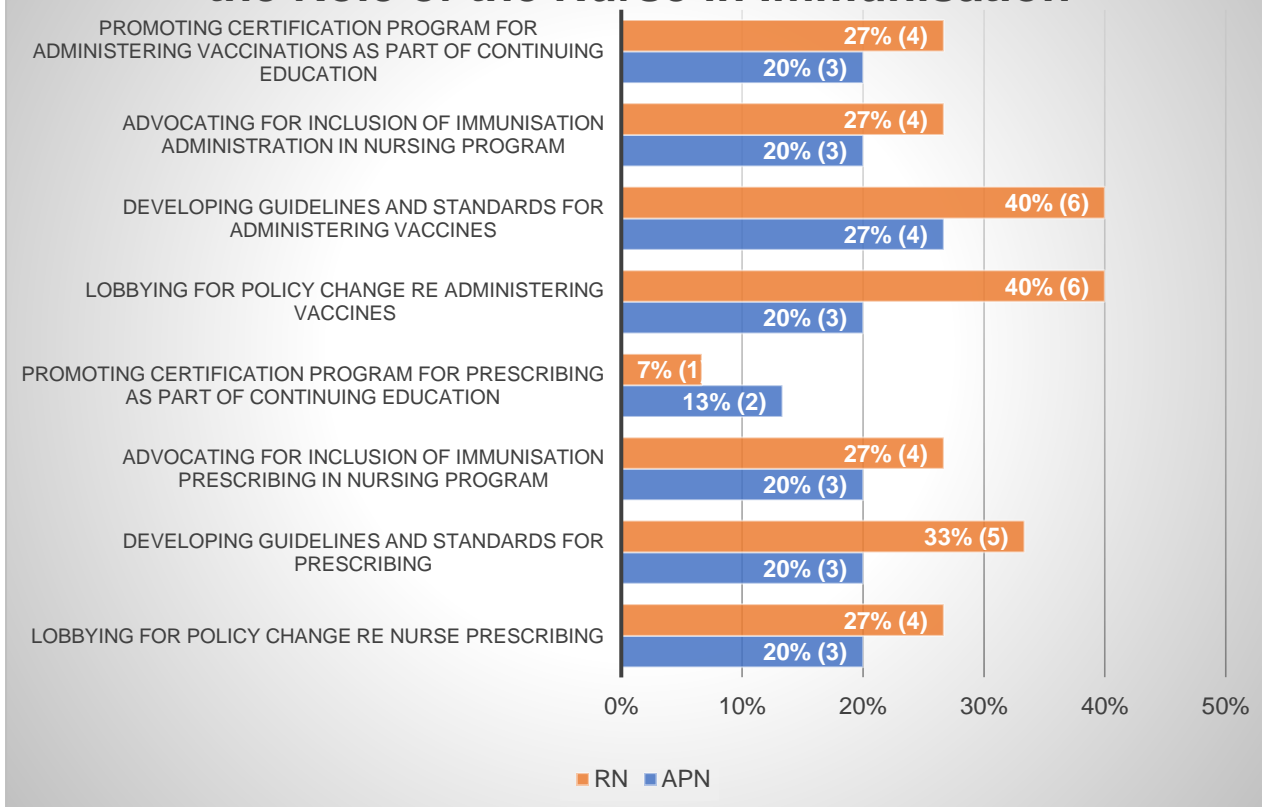


Table 6 - Activity by Organized Nursing to Expand the Role of the Nurse in Immunisation

The numbers represent the countries engaged in activity by category, 10 out of the 15 countries that took part in the survey

Collaboration in Immunisation Activities – Fourteen countries (over 93%) indicated that nurses partnered with physicians in carrying out immunisation activities, while 11 (over 73%) indicated they worked with public health officials and eight (over 53%) indicated they worked with pharmacists in these activities. A lesser number, six (40%) countries, indicated they worked with other categories of nurses while only four (over 26%) countries indicated they work with family caregivers. These partnerships may be important to leverage in addressing a number of the barriers to increase nursing's involvement in immunisation.

Key Findings

Considerable work by nursing associations is targeted to expanding the role of the nurse in immunisation largely in activities related to RN and to a lesser extent APN prescribing and RN vaccination administration.

4.6 Nurse Immunisation Role Engagement by Country

A further level of analysis was carried out to determine the degree of nurse immunisation role engagement across countries, based on a set of 19 indicators derived from the survey questions (See Appendix B). This analysis showed that there is still room for improvement: three (20%) countries were excelling engagement countries, eight (53%) were expanding engagement

countries and four (27%) were emerging engagement countries (see table in Appendix B, from left to right, left indicating the excelling and right the emerging).

While there were distinct differences in each category, it is noteworthy that in all categories there was medium to high engagement of the NNAs in enhancing the role of the nurse in immunisation. The profile of the three excelling engagement countries indicates they are countries where nurses are “very” likely to be involved in promoting and supporting immunisation, and are engaged in and prepared for all aspects of immunisation - education, management, administering, prescribing and advisory roles. In addition, they appear to have overcome barriers related to requirement for prescription and other individual, organisational and government/ system barriers to nurses’ engagement in immunisation; they have high stakeholder support for nurse prescribing; and there is high involvement of the NNA in enhancing and expanding this area of practice.

The profile of the eight expanding engagement countries indicates they are countries in which nurses are for the most part likely or very likely to promote and support immunisation, and are involved and prepared in many of the immunisation activities. In these countries’ nurses are not generally involved in managing vaccination nor in prescribing, albeit in some countries APNs do carry out this role. The barriers still to be overcome to achieve full participation in immunisation include prescription issues, organisational and individual issues and in some cases system/ government issues. Many of these countries are working on regulatory changes to enable nurse prescribing, and some have high stakeholder support for this. These countries have medium to high NNA involvement in enhancing the role of the nurse in immunisation and five out of the eight countries are engaged in expanding the role of the nurse in prescribing.

The profile of the four emerging engagement countries indicates they are countries where nurses are not likely to promote or support immunisation, and are generally not involved or prepared in the range of immunisation activities presented. In addition, there were barriers identified related to prescription and individual factors, and in some cases organisational and system government factors. None of these countries had high stakeholder support for RN or APN prescribing. Neither RNs nor APNs prescribed, however in one country regulatory changes were in process to enable prescribing. There was high to medium engagement of the NNAs in enhancing the role of the nurse in immunisation, and in two of these countries the NNAs were engaged in expanding the role of the nurse in prescribing.

Key Findings

Countries surveyed generally presented as excelling, expanding or emerging in relation to degree of nurse immunisation role engagement. Of the 15 participating countries, three (20%) were identified as excelling, eight (53%) as expanding and four (27%) as emerging in relation to nurse immunisation role engagement.

Countries excelling in nurse immunisation role engagement were those in which nurses were “very” likely to promote and support immunisation, and be involved and for the most part prepared in the full continuum of immunisation activities including education, immunisation management, vaccine administration and prescription, and advisory roles. They had overcome key barriers to full engagement in immunisation activities such as requirement for prescription and other individual, system, and organizational barriers. There was high stakeholder support for APN an RN prescribing and the NNA was engaged in expanding the role of nurses in prescribing, and enhancing their role in immunisation

4.7 Pfizer additional data analysis undertaken by Dr Timothy Skinner

Influenza vaccination is one of the most cost effective health interventions possible in the adult population (Hampson & Irving, n.d.) and GAVI have described immunising children as one of public health's "best buys" (GAVI The Vaccine Alliance, 2018). Immunisation and vaccination rates are a core preventative healthcare intervention and as such serve as a proxy indicator for Universal Health Coverage and are key to reducing the prevalence of both infectious disease and non-communicable diseases (NCDs). Vaccination is therefore a central tenant of Infection Prevention and Control (IPC) strategies and tackling antimicrobial resistance (AMR). Increasing vaccination rates will undoubtedly deliver significant health gains and improvements and contribute more generally to the strengthening of health systems. Whilst child vaccination rates are high at 90% or more in the overwhelming majority of OECD countries (OECD, 2018) there is very significant variation in influenza vaccination rates for people over 65, ranging from over 80% to less than 10% (OECD, 2018).

Removing barriers to increased vaccination rates should therefore be a policy imperative and, in order to further understand the relationship between nursing practice and immunisation and vaccination, analysis was undertaken comparing OECD vaccination rates with the survey results. Specifically, the relationship between nurses being authorised to prescribe vaccines and the preparedness of nurses to prescribe were analysed (see section 3.3 *Data analysis methodology*).

Key Findings

In relation to nurse's authority to prescribe, seven countries reported that no nursing roles were authorised to prescribe adult vaccinations and eight countries reported that at least one of the nursing roles were authorised to prescribe adult vaccinations. Analysis indicated that those countries where nurses were authorised to prescribe vaccinations had a higher vaccination rate (mean 57.4% SD 10,4) than countries where no nurses were authorised to prescribe vaccines (mean 36.2% Sd 19.9, $t=2.64$, $df=13$, $p=0.020$), see Table 7 below.

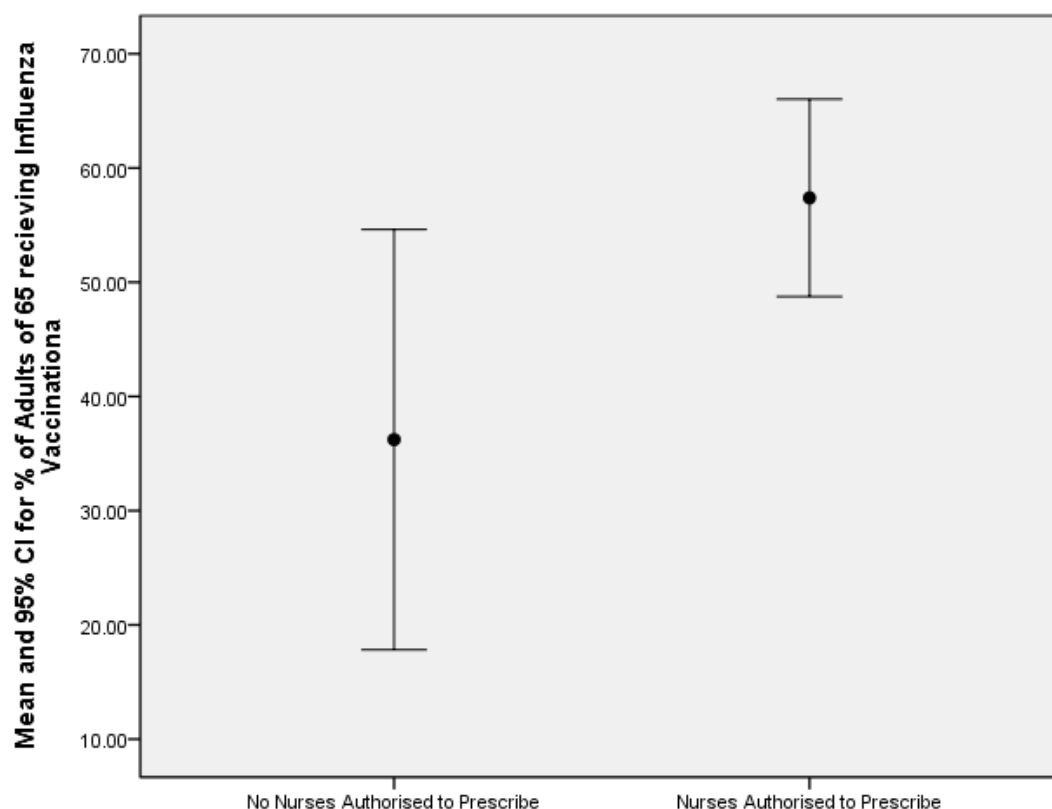


Table 7 - Data analysis undertaken by Dr Timothy Skinner

It is acknowledged that there are a range of variables that can influence vaccination rates such as health literacy, public information/campaigns and people's beliefs and perceptions. However, the potential to deliver a 20% mean increase in vaccination rates in countries, with the individual, population health and health systems strengthening benefits associated with that, should mean that nurse prescribing is considered as an urgent policy and political priority in those countries where nurses are not authorised to prescribe.

Turning to nurses preparedness' to immunise, the survey responses to seven preparedness factors were summed and countries were grouped into whether nurses were not prepared, somewhat prepared or prepared. An analysis of variance was used to look at the interaction between preparedness and authorisation on vaccination rates. The preparedness factors included providing immunisation information, education, assessment, administration, prescribing and advising on immunisation policy and programmes.

Five countries had a mean preparedness score of less than 1, indicating that nurses are "not prepared" for a role in vaccination, seven countries scored between 1 and 2 indicating that are "somewhat prepared" and three countries scored between 2 and 3, indicating that nurses were "adequately prepared"

A significant 20% mean increase in vaccination rates can be seen in countries where nurses are "somewhat prepared" compared to "not prepared" where nurse prescribing is not authorised. It is highly likely that preparedness has positively influenced both nurses competence and confidence to promote immunisation resulting in a positive impact in vaccination rates.

There was no significant difference in levels of preparedness between countries where nurses where authorised to prescribe or not. Whilst beyond the scope of this analysis, for countries where

nurses are authorised, but not prepared, there may be safety and competence implications which would present significant risks to adopting this as an approach to policy.

However, countries whose nurses scored higher on the preparedness items had higher rates of vaccinations ($r=.35$, $p0.032$) with a mean vaccination rate of more than 60% for those countries where nurse prescribing is authorised, and nurses are moderately (or is it adequately to well) prepared.

Overall a clear linear interaction ($F=11.39;df=1;p=.008$) can be seen in Table 8, indicating that preparedness improves vaccination rates in countries where nurses are authorised and in countries where nurses are not authorised to prescribe vaccinations.

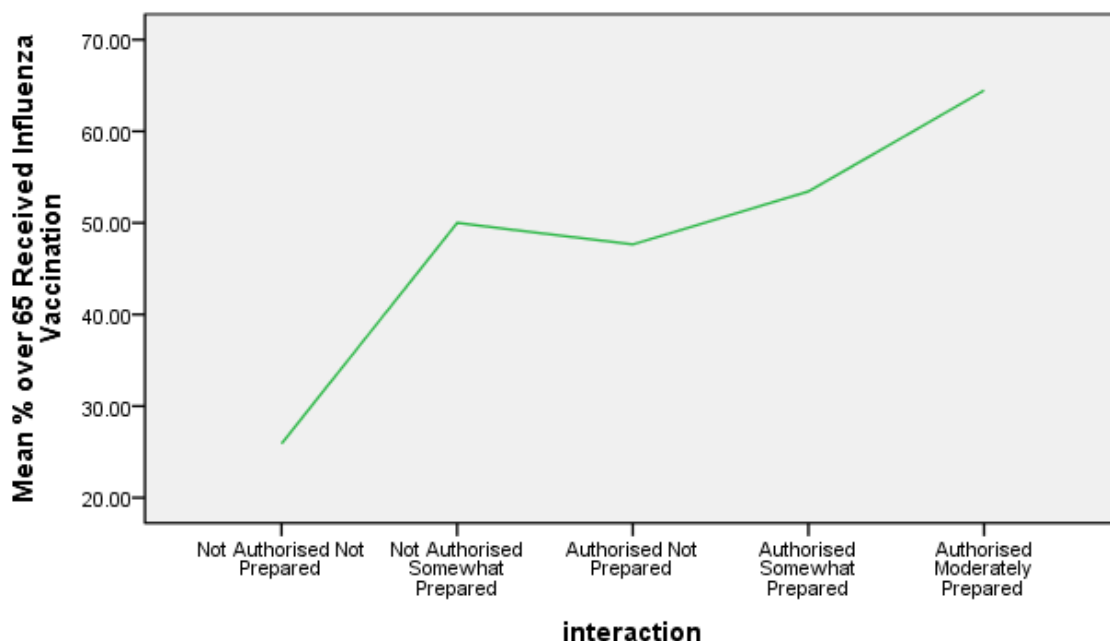


Table 8 - Data analysis undertaken by Dr Timothy Skinner

5. Conclusion and Recommendations

The survey results clearly identified that the single biggest barrier to nurses' engagement in immunisation was the requirement to have a prescription (Qu 4 56%). If this barrier were to be removed, the data analysis has identified the significant and positive impact that this would have on vaccination rates and the broader health and health system gains that would result from that.

In addition, the data analysis has identified the relationship between vaccination rates and nurse preparedness both in countries where nurses are authorised and those in which they not authorised to prescribe. Preparedness is therefore important in its own right, however policy action that both supports and promotes nurse preparedness and authorises nurses to prescribe will result in the largest increases to vaccination rates.

The joint second biggest barriers to nurses' engagement in immunisation highlighted in the survey responses were not having enough time/competing priorities and not enough training (both 40%, Qu 4). Through its regular surveying of National Nursing Associations, ICN is aware that concerns about nurses' workload, insufficient staffing and limited funding or opportunity for continuous professional development are consistent and widespread NNA priorities to which extensive

lobbying and campaigning activity is directed. It is highly probably that NNA activity in this area has directly resulted in improved nurse preparedness for immunisation. Clearly, more work and policy action is required, but the critical role of NNAs should be acknowledged and they should be proactively engaged in country policy design, development and evaluation processes.

WHO is currently developing a roadmap for access to medicines and vaccines, 2019-2023, which will include activities, actions and deliverables. ICN has actively contributed to this process and advocated for nurse prescribing, clinical engagement and leadership in policy making and governance arrangements and recognition of those factors essential to support health workforce capacity such as education and professional development. The roadmap will be subject to consultation with Member States and ICN will continue its lobbying activity including highlighting the new and important evidence contained in this report and the potential for policy action directed at enabling nurse prescribing and supporting the preparedness of nurses to prescribe to result in significant increases in vaccination rates and the wider health and health systems benefits associated with that.

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Appendix A

Survey: Nurses' Role in Immunisation



Advancing ICN's Immunisation Strategy

I. Role of the Nurse in Advocacy for Immunisation

This section is intended to gather broad information about the role of nurses in advocating for immunisation in your country. For each question the response set or rating scale is below the question or presented in a drop-down menu.

* 1. Using the scale below please rate how likely nurses are to promote and support immunisation in your country

- Very likely
- Likely
- Somewhat likely
- Not likely

* 2. Using the scale in the drop-down menu below please indicate which category of nurse is **most likely** and which is **least likely** to engage in the following immunisation-related activities.

Please select one of the following options:

- Most likely to engage in
- Least likely to engage in
- Not applicable

	APN	RN	LPN
Provide evidence-based immunisation information to patients (benefits, risks, common myths)	<input type="text"/>	<input type="text"/>	<input type="text"/>
Educate individuals and provide advice on vaccination (raise awareness about benefits and risks, discuss common myths)	<input type="text"/>	<input type="text"/>	<input type="text"/>
Determine individual's immunisation status, and/or remind them when their next vaccination is due	<input type="text"/>	<input type="text"/>	<input type="text"/>
Proactively identify individuals for appropriate immunisation	<input type="text"/>	<input type="text"/>	<input type="text"/>
Administer vaccinations to patients and/or persons in the community	<input type="text"/>	<input type="text"/>	<input type="text"/>
Prescribe the administration of vaccines	<input type="text"/>	<input type="text"/>	<input type="text"/>
Serve in an advisory capacity related to immunisation policy and programmes	<input type="text"/>	<input type="text"/>	<input type="text"/>

* 3. Using the scale in the drop-down menu please indicate **how prepared you feel each category of nurse is to engage** in the following activities

Please select one of the following options:

- Well prepared
- Adequally prepared
- Somewhat prepared
- Not prepared
- I do not know

	APN	RN	LPN
Provide evidence-based immunisation information to individuals (benefits, risks, common myths)	<input type="text"/>	<input type="text"/>	<input type="text"/>
Educate individuals and provide advice on vaccination (raise awareness about benefits and risks, discuss common myths)	<input type="text"/>	<input type="text"/>	<input type="text"/>
Determine individual's immunisation status and/or remind them when their next vaccination is due	<input type="text"/>	<input type="text"/>	<input type="text"/>
Proactively identify individuals for appropriate immunisation	<input type="text"/>	<input type="text"/>	<input type="text"/>
Administer vaccinations to patients and/or persons in the community	<input type="text"/>	<input type="text"/>	<input type="text"/>
Prescribe the administration of vaccines	<input type="text"/>	<input type="text"/>	<input type="text"/>
Serve in an advisory capacity related to immunisation policy and programmes	<input type="text"/>	<input type="text"/>	<input type="text"/>

* 4. Using the rating scale in the drop-down menu, indicate the extent to which the following issues occur in your country, that may be barriers to nurses' engagement in immunisation

Potential Barriers

Please select one of the following options:

- Great extent
- Moderate extent
- Somewhat of an extent
- Minimal extent
- Not at all

Extent to which the Issue is a Barrier to Nurses' Engagement in Immunisation

Not enough time/competing priorities	<input type="text"/>
Not enough training or knowledge or information to promote immunisation	<input type="text"/>
Personal values and beliefs about immunisation	<input type="text"/>
Beliefs about patient/public receptiveness to immunisation	<input type="text"/>
Lack of legislation or guidelines that allow nurses to immunise	<input type="text"/>
Required to have a prescription to immunise	<input type="text"/>
Lack of government funding for immunisation	<input type="text"/>
Lack of government/public health infrastructure to support immunisation	<input type="text"/>

II. Role of the Nurse in Prescribing Vaccinations

This section is intended to gather broad information about the authority of nurses to **prescribe** vaccines. For each question the response set or rating scale is below the question or presented in a drop-down menu.

- * 5. For each category of nurse indicate whether they can prescribe vaccinations, or if regulatory changes are in process to enable them to prescribe in the future, or if they cannot prescribe

	Authorized to prescribe vaccination	Not authorized, regulatory changes in process to enable prescribing	Not authorized to prescribe vaccination
APN	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
RN	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LPN	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. For those categories authorized to prescribe vaccination, please indicate additional requirements in place for nurses to prescribe vaccinations in your country

	APN	RN	LPN
Experience in related area of practice i.e., primary care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Educational requirement (course)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hours of supervised practice in prescribing vaccinations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to mentor or supervisor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- * 7. Indicate who is responsible for authorizing nurses to prescribe vaccinations in your country. Check all that apply.

- Government
- Ministry of Health
- Nursing Regulatory/Licensing Body
- Professional Association

- * 8. Indicate using the scale of “high”, “medium”, or “low” in the drop-down menu, the degree of stakeholder group support for APNs and RNs to prescribe as part of scope of practice

Stakeholder Group

Please select one of the following options:

- High
- Medium
- Low

	APN	RN
Policy makers (government/ ministry of health)	<input type="text"/>	<input type="text"/>
Nursing Regulatory Body	<input type="text"/>	<input type="text"/>
Physicians	<input type="text"/>	<input type="text"/>
Nurses	<input type="text"/>	<input type="text"/>

III. Role of the Nurse in Administering Vaccinations

This section is intended to gather broad information about the authority of nurses to administer vaccines. For each question, the response set or rating scale is below the question or presented in a drop-down menu.

- * 9. For each category of nurse indicate whether they can administer vaccinations, or if regulatory changes are in process to enable them to administer vaccinations in the future, or if they cannot administer vaccinations

	Administer vaccines	Do not administer vaccines, regulatory changes in process to administer vaccines	Do not administer vaccines
APN	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
RN	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LPN	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Note: If any of the above categories of nurse administers vaccines, please complete questions 10 and 11

10. Indicate to which types of patient and in what settings each category of nurse administers vaccines

Patient type or setting

Please select one of the following options:

- Not applicable
- Yes
- No
- I do not know

	APN	RN	LPN
Children and Paediatric Patients	<input type="text"/>	<input type="text"/>	<input type="text"/>
Adults under age of 65	<input type="text"/>	<input type="text"/>	<input type="text"/>
Adults 65 years and older	<input type="text"/>	<input type="text"/>	<input type="text"/>
High risk patients	<input type="text"/>	<input type="text"/>	<input type="text"/>
In Hospital Settings	<input type="text"/>	<input type="text"/>	<input type="text"/>
In Long Term Care Facilities	<input type="text"/>	<input type="text"/>	<input type="text"/>
In Primary Care Settings including Private Offices	<input type="text"/>	<input type="text"/>	<input type="text"/>
In Community Clinics	<input type="text"/>	<input type="text"/>	<input type="text"/>

11. Indicate the type of training and education required by each category of nurse that administers vaccines.

Type of training

Please select one of the following options:

- Yes
- No
- I do not know
- Not applicable

	APN	RN	LPN
Part of nursing education curriculum	<input type="text"/>	<input type="text"/>	<input type="text"/>
Post-registration (continuing education)	<input type="text"/>	<input type="text"/>	<input type="text"/>
On the job skill building	<input type="text"/>	<input type="text"/>	<input type="text"/>

IV. Expanding the Role of the Nurse in Immunisation

This section is intended to gather further information about possible changes in the role of nurses in immunisation in your country.

* 12. Is there activity in your country to expand the role of nurses in immunisation

- Yes
 No
 I do not know

13. If you answered YES to question 12, please specify the types of activities to expand the role of the nurse in immunisation being carried out for each category of nurse

	APN	RN	LPN
Lobbying for policy change related to immunisation prescribing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Development of regulations, guidelines and/or standards to support nurse prescribing immunisation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advocating for inclusion of immunisation prescribing in nursing programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Promoting certification programs for prescribing immunisation as part of continuing education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lobbying for policy change related to administration of vaccines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Development of regulations, guidelines and standards to support nurses administering vaccines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advocating for inclusion of vaccine administration in nursing programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Promoting continuing education certification programs in educational settings for administering vaccines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

* 14. With what other health care providers do nurses partner to promote immunisation in your country? Please indicate all that apply

Health Care Provider

- Pharmacists
- Physicians
- Other Categories of Nurses
- Family Care Givers
- Public Health Officials (public health agency staff)

V. Respondent Details

This section is intended to obtain information about you or your organization as a survey respondent. For each question, the response set or rating scale is below the question or presented in a drop-down menu.

* 15. Indicate what respondent type applies to you or your organization

- National Nursing Association
- National Nursing Union
- Chief Nurse or focal point for nursing in my jurisdiction
- Specialty Nursing Association (National/Regional)
- National Nursing Regulatory Body
- Regional Nursing Body

* 16. Indicate how engaged your organization is in enhancing the role of the nurse in the following immunisation related activities

	Highly engaged	Engaged	Somewhat engaged	Not engaged	Not a priority
Provide evidence-based immunisation information to patients (benefits, risks, common immunisation myths)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Educate individuals and provide advice on vaccination (raise awareness about benefits and risks, discuss common myths)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determine patient's immunisation status, and/or remind them when their next vaccination is due	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Proactively identify individuals for appropriate immunisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Administer vaccines to patients and/or persons in the community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prescribe or authorize the administration of Vaccines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Serve in an advisory capacity related to immunisation policy and programmes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 17. Indicate what sources you used to complete this survey.

- Our organization's up to date information in this area
- Input from our member associations/affiliates
- Input from expert key informants
- Input from a relevant committee/group in our jurisdiction

* 18. We recognize that there may be variation across regions in your country which may impact your responses. Please indicate how representative your response is of the country as a whole

- Very Representative (There is much consistency)
- Mostly Representative (Gained broad input)
- Somewhat Representative (Some variation across regions)
- Minimally Representative (Much variation across regions)

* 19. Please select the country you are representing in this survey

Appendix B

Table Showing Categories of Nurse Immunisation Role Engagement by Country Based on Selected Indicators Derived from the Nurse Immunisation Role Survey

		←..... Continous improvement.....→														
		Country 1	Country 2	Country 3	Country 4	Country 5	Country 6	Country 7	Country 8	Country 9	Country 10	Country 11	Country 12	Country 13	Country 14	Country 15
I n d i c a t o r	NURSES Very likely or likely to promote & support immunisation	X	X	X	X	X	X	X		X	X	X				X
	APNs/RNs involved in education	X	APN	X	X	X	X	X	X	X	RN	X			RN	RN
	APNs/RNs involved in managing vaccination	X	APN	X	X	X	X		X	X	RN	X				
	APNs/RNs involved in administering vaccine	X	X	X	RN	X	X	X	X	X	RN	X		X	RN	RN
	APNs/RNs involved in prescribing vaccine	X	APN	X	APN				APN	APN		X				
	APNs/RNs prepared to provide education	X	APN	X	APN	X	X	X	X	X	RN	X			RN	
	APNs/RNs prepared in managing vaccination	X	X	X	APN	X	X		X	APN		X				
	APNs/RNs prepared to administer vaccine	X	X	X	X	X	X	X	X	X	RN	X		X	RN	X
	APNs/RNs prepared to prescribe vaccination	X	X	X	APN		X		APN	X		APN				
	Prescription issues not a barrier	X	X	X		X			X		X					
	Organisational issues not barrier	X	X	X				X			X		X	X	X	
	System Govt issues not barrier	X	X	X	X		X	X	X	X	X	X	X		X	
	Individual issues not a barrier	X	X						X		X		X			
	APNs RNs administer vaccine or regulatory changes in process	X	X	X	X	X	X	X	X	X	X	X	RN	X	X	X
	APNs RNs prescribe vaccine or regulatory changes	X		X	X				APN	APN	RN	X	RN			
	Vaccination administration part of basic nursing	X	X	X	X	X	X	X	X		X		RN	X	X	X
	High support 3 out of 4 stakeholders for APN/RN prescribing	X	X	X	X		X		APN only	X	X	X				
NNA engaged in enhancing role of the nurse in immunisation High 6,7 Med 3-5 Low 1,2	High	High	High	High	Med	Med	Med	Med	Med	High	Med	Med	High	Med	High	
NNA engaged in expanding role of nurse in prescribing		X	X	X	X				X	X	X	X			X	