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Seasonal influenza vaccine coverage among high-risk populations in Thailand, 2010–2012

Jocelynn T. Owusu[a,b], Prabda Prapasiri[b], Darunee Ditsungnoen[b], Grit Leetongin[c], Pornsak Yoocharoen[d], Jarowee Rattanayot[c], Sonja J. Olsen[b,e], Charung Muangchana[f,*]

[a] ASPPH/CDC Allan Rosenfield Global Health Fellow, Atlanta, GA, USA
[b] Influenza Program, Thailand Ministry of Public Health–U.S. Centers for Disease Control and Prevention Collaboration, Nonthaburi, Thailand
[c] National Health Security Office, Bangkok, Thailand
[d] Department of Disease Control, Ministry of Public Health, Nonthaburi, Thailand
[e] Influenza Division, Centers for Disease Control and Prevention, Atlanta, GA, USA
[f] National Vaccine Institute, Nonthaburi, Thailand

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ABSTRACT

Background: The Advisory Committee on Immunization Practice of Thailand prioritizes seasonal influenza vaccinations for populations who are at highest risk for serious complications (pregnant women, children 6 months–2 years, persons ≥65 years, persons with chronic diseases, obese persons), and healthcare personnel and poultry cullers. The Thailand government purchases seasonal influenza vaccine for these groups. We assessed vaccination coverage among high-risk groups in Thailand from 2010 to 2012.
Methods: National records on persons who received publicly purchased vaccines from 2010 to 2012 were analyzed by high-risk category. Denominator data from multiple sources were compared to calculate coverage. Vaccine coverage was defined as the proportion of individuals in each category who received the vaccine. Vaccine wastage was defined as the proportion of publicly purchased vaccines that were not used.
Results: From 2010 to 2012, 8.18 million influenza vaccines were publicly purchased (range, 2.37–3.29 million doses/year), and vaccine purchases increased 39% over these years. Vaccine wastage was 9.5%. Approximately 5.7 million (77%) vaccine doses were administered to persons ≥65 years and persons with chronic diseases, 1.4 million (19%) to healthcare personnel/poultry cullers, 82,570 (1.1%) to children 6 months–2 years, 78,885 (1.1%) to obese persons, 26,481 (0.4%) to mentally disabled persons, and 17,787 (0.2%) to pregnant women. Between 2010 and 2012, coverage increased among persons with chronic diseases (8.6% versus 14%; $p < 0.01$) and persons ≥65 years (12%, versus 20%; $p < 0.01$); however, coverage decreased for mentally disabled persons (6.1% versus 4.9%; $p < 0.01$), children 6 months–2 years (2.3% versus 0.9%; $p < 0.01$), pregnant women (1.1% versus 0.9%; $p < 0.01$), and obese persons (0.2% versus 0.1%; $p < 0.01$).
Conclusions: From 2010 to 2012, the availability of publicly purchased vaccines increased. While coverage remained low for all target groups, coverage was highest among persons ≥65 years and persons with chronic diseases. Annual coverage assessments are necessary to promote higher coverage among high-risk groups in Thailand.
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1. Introduction

Influenza is an acute, vaccine-preventable infection that annually leads to an estimated 3–5 million severe illness episodes and approximately 500,000 deaths globally [1,2]. Influenza vaccination is the most effective way to prevent influenza virus infection. The World Health Organization (WHO) recommends vaccinating those most at risk for serious complications, including young children, the elderly, those with chronic illnesses, and pregnant women [2]. Vaccination is also recommended for those who easily transmit influenza to high-risk populations (i.e., healthcare personnel) [3,4].

Although influenza vaccine is not commonly used in most countries in Southeast Asia, the burden of influenza in Southeast Asia is similar to that in other parts of the world where influenza

* Corresponding author. Tel.: +662 5903196.
E-mail address: charungm@hotmail.com (C. Muangchana).

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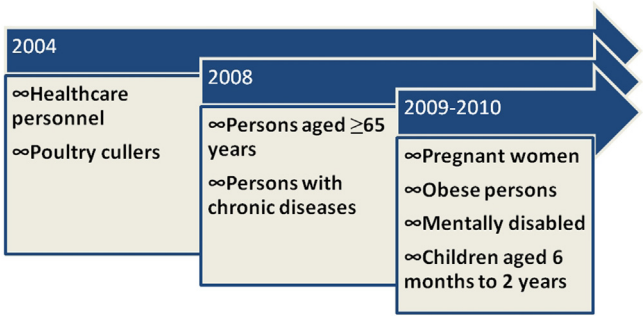

Fig. 1. ACIP-recommended influenza vaccination target groups in Thailand by year of recommendation.

vaccine is now routinely used [5–7]. In Thailand from 2005 to 2008, the annual incidence of influenza in young children <5 years was 236 per 100,000 and in persons aged ≥75 was 375 per 100,000 [8].

In Thailand, seasonal vaccination was first used in the public sector in 2004 to vaccinate healthcare personnel and poultry cullers in response to avian influenza A (H5N1), and its use in pandemic preparedness efforts was articulated in Thailand's 1st National Strategy Plan for Pandemic Influenza Preparedness [9]. Currently, Thailand purchases seasonal influenza vaccines which are provided free of charge to four high-risk groups: healthcare personnel, poultry cullers, persons aged ≥65 years, and persons with chronic diseases [10,11]. Over time Thailand's Advisory Committee on Immunization Practice (ACIP) has expanded influenza vaccine recommendations to include eight high-risk populations (Fig. 1) [12,13]. Government purchase of influenza vaccine increased over 350% between 2009 and 2011 (520,000–2.38 million doses) [14]. Here, we estimate influenza vaccine uptake and coverage among high-risk populations in Thailand's public sector, and assess vaccine wastage. These data can be used to evaluate and inform the national vaccination program.

2. Methods

We conducted a retrospective review of seasonal influenza vaccine use in the public sector in Thailand from 2010 to 2012. Since this study was evaluating a national program, it was exempt from ethical review.

2.1. Study setting

Thailand is a middle-income country located in Southeast Asia that has a population of 66.0 million (est. 2010) [15]. The Thai GDP per capita is $5,318USD (est. 2012) [16], and 3.5% of Thailand's GDP is spent on health expenditures (est. 2006) [17]. Thailand can be divided into five geographic regions (total est. 2010 population in parentheses): Metropolitan Bangkok (8.3 million), North (11.6 million), Northeast (19.0 million), Central (18.2 million), and South (8.9 million).

2.2. Influenza vaccine distribution

The Thailand National Health Security Office (NHSO) is responsible for providing health promotion activities, prevention services, treatment, and rehabilitation services to all who are enrolled in the Universal Coverage Scheme [18]. The Universal Coverage Scheme provides health insurance to nearly 75% of the Thai population, with the remainder being covered under the Social Security Scheme and the Civil Servant Medical Benefits Scheme. Following the 2008 recommendation by Thailand's ACIP to vaccinate persons aged ≥65 years and persons with chronic diseases, NHSO began purchasing vaccine for these two high-risk groups. Vaccines purchased were inactivated, trivalent vaccines, provided to the Ministry of Public Health in multi-dose formulation (four doses per vial). Vaccines were distributed to each province based on the estimated number of persons in these two target groups (some swapping of vaccine between provinces may have occurred). Vaccination was administered in provincial and district hospitals during a 3-month campaign (or until vaccine ran out) starting in June of each year. In Thailand, outpatient clinics in hospitals serve as primary care centers. Healthcare personnel received no additional incentive for providing vaccines to the target groups. When administering vaccine, while healthcare providers prioritized the two target groups, vaccine was also administered to the other five target groups falling under the ACIP recommendation (pregnant women, obese persons weighing >100 kg and/or having a body mass index ≥35 kg/m^2, mentally disabled persons, and children aged 6 months–2 years). Healthcare personnel and poultry cullers also received vaccines free of charge, although these were purchased by the Department of Disease Control of the Ministry of Public Health. For the purposes of this study, 'publicly purchased vaccines' refer to those purchased by the Department of Disease Control and NHSO.

2.3. Vaccine database

Each vaccination event was recorded in an electronic health record that was developed by NHSO for reimbursement purposes. After each vaccination, hospital staff entered the vaccine recipient's 13-digit unique identification number, date of birth, date of vaccination, risk group category, province, and type of health insurance into the electronic health record. Patients not covered by the Universal Coverage Scheme could still be vaccinated and entered into this system. National data were compiled by NHSO.

2.4. High-risk group classification

In the NHSO electronic database, vaccinees were classified into pre-defined risk groups. Each vaccinee was assigned to only one risk category and some risk categories changed over time. If a vaccinee fell into >1 risk category, s/he would first be classified in either the chronic disease or aged ≥65 years groups; for the remaining risk categories, classification was at the discretion of the healthcare provider. Four risk categories were consistent from 2010 to 2012: obese persons, young children aged 6 months–2 years, mentally disabled persons, and pregnant women. Three risk categories changed between 2010 and 2011–2012: persons aged ≥65 years, persons with chronic diseases and healthcare personnel/poultry cullers. Among the persons aged ≥65 years category, in 2010 all persons aged ≥65 years regardless of health status were included, whereas in 2011–2012, persons aged ≥65 years with chronic diseases were excluded from the category. In 2010, the persons with chronic diseases category excluded persons aged ≥65 years with chronic diseases; however, in 2011–2012 this category included all persons with chronic diseases regardless of age. Finally, the healthcare personnel/poultry cullers category included all such workers in 2010, while in 2011–2012 poultry cullers/healthcare personnel with chronic diseases were excluded from this category.

2.5. Denominator data sources

We used three different data sources to estimate the denominator; coverage for some risk group categories was estimated using more than one approach.

2.6. National Statistical Office data

The National Statistical Office reports census data on all registered nationals [19]. We used these data to estimate the

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