Expanding childhood immunization to family immunization: Strategies to increase immunization coverage in children attending school, pregnant women, the elderly and health care workers

José Ignacio Santos  M Sc., MD
Profesor of Experimental Medicine
Facultad de Medicina
Universidad Nacional Autónoma de México
Vaccination of special populations

One of the strategic objectives of the 2011-2020 Global Vaccine Action Plan is for the benefits of immunization to be equitably extended to all people.

The Pan American Health Organization has prompted a complete transition from childhood to family immunization in which countries incorporate into their national schedules appropriate vaccines for all family members throughout their lives.
School based vaccination in Latin America

• Approximately 117 million children and adolescents attend preschool, primary or secondary school

• 6.5 million children do not attend

• 15.6 million that do attend, do so while being two or more years behind due to school failure
History of school based vaccination in Mexico

• Following the measles pandemic of 1998-1999, a second measles dose was introduced into Mexico’s immunization calendar upon school entry at approximately 6 years of age as part of National Health Weeks.

• Measles second dose helped to consolidate school based immunization as a platform for future immunization efforts.

• In the year 2000, immunization calendar was established for adolescents: Hep B, Td and MR.

• In 2012 HPV was introduced for girls enrolled in the fifth grade (2 doses) 11yrs for non enrolled approx 500,000.
Under-vaccinated children

Predominance of immunization system factors

• Missed opportunities to vaccinate are a major contributor

• Factors that contribute to missed opportunities:
  – logistics (distance, stock-outs)
  – parent/care-giver understanding
  – health staff’s attitudes, knowledge, performance and motivation
International evaluation of Mexico’s Universal Immunization Program 2014 *

PAHO/WHO and Mexico’s Ministry of Health
International evaluation of Mexico’s Universal Immunization Program 2014 *

PAHO/WHO and Mexico’s Ministry of Health
Most frequent reasons for missed opportunities during visit to health facility in children with incomplete schedules

- Vaccine stockouts
- Vaccination not scheduled
- Intercurrent illness

Speech Bubble:

- Desabastecimiento de vacuna
- No le tocaba
- Niño enfermo

- Vaccine stockouts
- Vaccination not scheduled
- Intercurrent illness
Social determinants as risk factors for unvaccinated children

- **Education, particularly mother’s education**, affects utilization of health services

- **Parental attitudes and knowledge** (return date/fear of side effects vs. scientific)

- **Family characteristics** (demographic and sociological) are important underlying factors

- **Distance to health facilities** (conflicting priorities)

- **Social exclusion** (perceived or real)
Adolescent Consent for Vaccination: A Position Paper of the Society for Adolescent Health and Medicine

• Adolescent vaccine coverage lags far behind that for younger age groups.

• Focused prevention of tetanus, pertussis, meningococcal disease and genital warts, as well as cervical and other human papillomavirus–related cancers.

• Requirement to obtain parental consent for vaccination is a significant barrier to improving adolescent vaccine uptake across all health care settings for adolescents
Adolescent and pre adolescent HPV vaccination in developing countries*

The potential HPV target population in developing countries dwarfs that of industrialized countries.

Recent estimates indicate that there is an estimated 52.5 million 11-year-old girls in developing countries, compared to 6.5 million in industrialized countries.

Strong indications of likely domestic and external funding, as well as country political commitment to use the vaccine, could help give manufacturers the assurances necessary to scale-up production to meet developing country demand.

*IAVI
HPV Vaccination in Latin America:

Target groups and venues: Lessons learned

• Delivering HPV vaccine through easily accessible primary schools can achieve high coverage levels at reasonable incremental program costs.

• Early coordination between the health and education sectors is necessary to establish a feasible vaccination schedule for a multi-dose vaccine.

• Health workers should aim to visit schools just once per dose, and follow-up of girls who miss doses should be carried out through health centers.
All the girls were injected in recent months with the HPV vaccine Gardasil, leading desperate parents to point the finger at authorities and the drug's American manufacturer, Merck. Health experts say the vaccines are safe and have criticized Colombian media for stirring baseless concerns about their application.

THE CANADIAN PRESS/AP, Daily Free Press, Charles Buchanan
Hundreds of teenage girls in Colombia struck by mystery illness

The Associated Press  August 27, 2014 7:34 pm
Results from Peru’s demonstration project

A vaccination program protocol helped to maintain quality, facilitate training, standardize delivery and engender community trust.

Coverage rates were above 80% in all Peru project sites, and loss to follow-up of girls who started the three-dose series was low.

Clear, concise guidance is required to standardize adverse event reporting.

The school system and teachers should be engaged to teach children about immunization.
Adult vaccination

Substantial burden of disease in adults for which vaccines available.

Vaccination rates low among adults more so in developing countries

Implementation of standards is key to increasing awareness of adult immunization, improving vaccine coverage, and reducing racial and ethnic disparities in vaccine coverage

Many tools and resources available to:

- Help providers implement practice standards
- Educate patients on the importance of vaccination
### Vaccination coverage in adults >60 yrs by vaccine and schedule. México*

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Influenza (%)</th>
<th>Pneumococcus (%)</th>
<th>Tetanus (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(IC al 95%)</td>
<td>(IC al 95%)</td>
<td>(IC al 95%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>56.53</td>
<td>44.28</td>
<td>61.77</td>
</tr>
<tr>
<td></td>
<td>55.56-57.51</td>
<td>43.30-45.26</td>
<td>60.81-62.71</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>53.86</td>
<td>42.05</td>
<td>60.24</td>
</tr>
<tr>
<td></td>
<td>52.42-55.30</td>
<td>40.62-43.49</td>
<td>58.83-61.66</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>58.94</td>
<td>46.28</td>
<td>63.13</td>
</tr>
<tr>
<td></td>
<td>57.61-60.28</td>
<td>44.93-47.64</td>
<td>61.83-64.43</td>
</tr>
<tr>
<td><strong>Age group</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 – 64</td>
<td>51.69</td>
<td>38.58</td>
<td>58.44</td>
</tr>
<tr>
<td></td>
<td>49.88-53.50</td>
<td>36.80-40.36</td>
<td>56.66-60.21</td>
</tr>
<tr>
<td>65 – 69</td>
<td>58.14</td>
<td>46.53</td>
<td>64.04</td>
</tr>
<tr>
<td></td>
<td>56.12-60.16</td>
<td>44.47-48.59</td>
<td>62.06-66.02</td>
</tr>
<tr>
<td>70 – 74</td>
<td>60.68</td>
<td>48.35</td>
<td>64.35</td>
</tr>
<tr>
<td></td>
<td>58.51-62.84</td>
<td>46.13-50.57</td>
<td>62.21-66.48</td>
</tr>
<tr>
<td>75 y más</td>
<td>53.74</td>
<td>41.36</td>
<td>56.12</td>
</tr>
<tr>
<td></td>
<td>49.15-58.33</td>
<td>37.01-45.71</td>
<td>51.65-60.59</td>
</tr>
</tbody>
</table>

* ENSANUT
# Meta-Analysis of Interventions to Increase Use of Adult Immunization

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Odds Ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational change (e.g., standing orders, separate clinics devoted to prevention)</td>
<td>16.0</td>
</tr>
<tr>
<td>Provider reminder</td>
<td>3.8</td>
</tr>
<tr>
<td>Patient financial incentive</td>
<td>3.4</td>
</tr>
<tr>
<td>Provider education</td>
<td>3.2</td>
</tr>
<tr>
<td>Patient reminder</td>
<td>2.5</td>
</tr>
<tr>
<td>Patient education</td>
<td>1.3</td>
</tr>
</tbody>
</table>

*Compared to usual care or control group, adjusted for all remaining interventions

Recommendations to improve adult vaccination coverage in Latin America*

The criteria for including a recommendation to improve adult vaccination coverage in Latin America are:

that it be timely, reasonable, effective, relevant and clear.

While the challenges to adult vaccination coverage are multifactorial, they can be overcome by a commitment from government, payers, health care professionals and others.

Most important, every country should have a nationwide schedule for adult immunization

Vaccination of Pregnant Women: Two-For-One

Influenza vaccination of pregnant women

Reduce risk of influenza illness in pregnant women
Reduce risk of influenza illness, fevers and influenza hospitalizations in infants during first 6 months of life
Vaccinate with inactivated flu vaccine (not live vaccine) during pregnancy

Tdap vaccination of pregnant women

Vaccinate in 3rd trimester to transfer antibody to infant prior to birth
Prevents pertussis in mom and protects infant
Tdap vaccination during pregnancy estimated to be 93% effective in preventing pertussis in infants <4 months old

Pregnant women should NOT receive any live vaccines (e.g. live influenza vaccine, MMR, varicella or shingles vaccines)

Countries and territories in the Americas with policies for seasonal influenza vaccination. Official and unofficial reports to PAHO.

<table>
<thead>
<tr>
<th>Number of countries with:</th>
<th>2004</th>
<th>2008</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policies for influenza vaccination*</td>
<td>13 (29%)</td>
<td>35 (78%)</td>
<td>40 (89%)</td>
</tr>
<tr>
<td>Vaccination of healthy children</td>
<td>6 (13%)</td>
<td>22 (49%)</td>
<td>25 (56%)</td>
</tr>
<tr>
<td>Vaccination of children with chronic diseases</td>
<td>-</td>
<td>-</td>
<td>5 (11%)</td>
</tr>
<tr>
<td>Vaccination of the elderly</td>
<td>12 (27%)</td>
<td>33 (73%)</td>
<td>38 (84%)</td>
</tr>
<tr>
<td>Vaccination of persons with chronic diseases</td>
<td>9 (20%)</td>
<td>24 (53%)</td>
<td>35 (78%)</td>
</tr>
<tr>
<td>Vaccination of health care workers</td>
<td>3 (7%)</td>
<td>32 (71%)</td>
<td>38 (84%)</td>
</tr>
<tr>
<td>Vaccination of pregnant women</td>
<td>3 (7%)</td>
<td>7 (16%)</td>
<td>29 (64%)</td>
</tr>
</tbody>
</table>

*Data not collected from the French Departments (French Guiana, Guadeloupe, Martinique).

Pearson's correlation coefficient for linear regression using data for 11 years = 0.9, p = 0.0002.
Influenza vaccination coverage among pregnant women, data from selected countries in the Americas Region, 2014.
Countries and territories in the Americas with policies for seasonal influenza vaccination. Official and unofficial reports to PAHO.

<table>
<thead>
<tr>
<th>Number of countries with:</th>
<th>2004</th>
<th>2008</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policies for influenza vaccination*</td>
<td>13 (29%)</td>
<td>35 (78%)</td>
<td>40 (89%)</td>
</tr>
<tr>
<td>Vaccination of healthy children</td>
<td>6 (13%)</td>
<td>22 (49%)</td>
<td>25 (56%)</td>
</tr>
<tr>
<td>Vaccination of children with chronic diseases</td>
<td>-</td>
<td>-</td>
<td>5 (11%)</td>
</tr>
<tr>
<td>Vaccination of the elderly</td>
<td>12 (27%)</td>
<td>33 (73%)</td>
<td>38 (84%)</td>
</tr>
<tr>
<td>Vaccination of persons with chronic diseases</td>
<td>9 (20%)</td>
<td>24 (53%)</td>
<td>35 (78%)</td>
</tr>
<tr>
<td>Vaccination of health care workers</td>
<td>3 (7%)</td>
<td>32 (71%)</td>
<td>38 (84%)</td>
</tr>
<tr>
<td>Vaccination of pregnant women</td>
<td>3 (7%)</td>
<td>7 (16%)</td>
<td>29 (64%)</td>
</tr>
</tbody>
</table>

*Data not collected from the French Departments (French Guiana, Guadeloupe, Martinique).

Pearson's correlation coefficient for linear regression using data for 11 years = 0.9, p = 0.0002.
Influenza vaccination coverage among adults 60 years of age or older, data from selected countries, 2014.

Note all countries used the administrative method for estimating influenza vaccination coverage

Countries and territories in the Americas with policies for seasonal influenza vaccination. Official and unofficial reports to PAHO.

<table>
<thead>
<tr>
<th>Number of countries with:</th>
<th>2004</th>
<th>2008</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policies for influenza vaccination</td>
<td>13 (29%)</td>
<td>35 (78%)</td>
<td>40 (89%)</td>
</tr>
<tr>
<td>Vaccination of healthy children</td>
<td>6 (13%)</td>
<td>22 (49%)</td>
<td>25 (56%)</td>
</tr>
<tr>
<td>Vaccination of children with chronic diseases</td>
<td>-</td>
<td>-</td>
<td>5 (11%)</td>
</tr>
<tr>
<td>Vaccination of the elderly</td>
<td>12 (27%)</td>
<td>33 (73%)</td>
<td>38 (84%)</td>
</tr>
<tr>
<td>Vaccination of persons with chronic diseases</td>
<td>9 (20%)</td>
<td>24 (53%)</td>
<td>35 (78%)</td>
</tr>
<tr>
<td>Vaccination of health care workers</td>
<td>3 (7%)</td>
<td>32 (71%)</td>
<td>38 (84%)</td>
</tr>
<tr>
<td>Vaccination of pregnant women</td>
<td>3 (7%)</td>
<td>7 (16%)</td>
<td>29 (64%)</td>
</tr>
</tbody>
</table>

*Data not collected from the French Departments (French Guiana, Guadeloupe, Martinique).

Pearson’s correlation coefficient for linear regression using data for 11 years = 0.9, p = 0.0002.
Influenza vaccination coverage among healthcare workers, data from selected countries, 2014

Expansion of seasonal influenza vaccination in the Americas Vaccination Week of the Americas (VWA)

Influenza vaccination is being carried out during VWA.

VWA is now part of a broader global initiative, the World Immunization Week in all regions of WHO.
Vaccination Week in the Americas

Flu vaccination is taking place in Nicaragua during Vaccination Week in the Americas (VWA). VWA is part of a wider global initiative called World Immunization Week, recognized by all regions of the World Health Organization.

In Brazil over 15 million adults vaccinated during VWA
The Partnership for Influenza Vaccine Introduction (PIVI)

PIVI works with low and lower-middle income countries to develop sustainable influenza vaccine programs to reduce the burden of influenza globally.

This is accomplished through a collaboration among ministries of health (MoH), CDC, The Task Force for Global Health, the private sector, academic and NGO partners who work together to procure and distribute influenza vaccine and evaluate the impact of vaccination in recipient countries.

Building on two successful years of a pilot Vaccine Donation Project, the Partnership will expand in 2016-7 as PIVI, to engage new countries and new donors.
PIVI Donors

PIVI donors include bioCSL who donated more than three quarters of a million doses of vaccine this year, Walgreens Company, and Amerisource Bergen (a new partner) which together donated flu vaccine and **funds to purchase vaccine at reduced cost through the Pan-American Health Organization (PAHO) Revolving Fund**.

In addition, Dickinson and Company (BD) donated ancillary supplies including syringes and safety boxes.

The Partnership’s mission is supported by a grant from the Bill & Melinda Gates Foundation* awarded in 2013.
PIVI and Nicaragua

In Nicaragua, the donated flu vaccine by PIVI is supplementing other vaccine purchased through the PAHO Revolving Fund by the Government of Nicaragua.

Nicaragua usually targets their flu vaccine supplies to children and health care workers; this is the second year that Nicaragua has expanded their seasonal flu vaccination program to vaccinate more pregnant women. Since 2013 more than 52,000 pregnant women have been protected against seasonal influenza.
Expanding Immunization beyond childhood: Countries should assess existing health legislation and regulations to ensure that national laws:

– Promote family immunization through specific provisions including no-cost, obligatory vaccination;

– Recognize the importance of immunization within the health budget and make specific provision for purchase of vaccines;

– Using information from systematic reviews is important for choosing interventions, but considering local context is equally important.

• Observed problems
• Community preferences and priorities
• Specific interventions that are feasible and appropriate
Health Equity

- Refers to fairness in the distribution of health or the provision of healthcare
- More importantly, health equity refers to larger issues of fairness and justice in social arrangements and overall societal fairness
What moves us, reasonably enough, is not the realization that the world falls short of being completely just – which few of us expect – but that there are clearly remediable injustices around us which we want to eliminate.

Amartya Sen 2009 – The idea of Justice
Thank you!

Спасибо!

¡Gracias!