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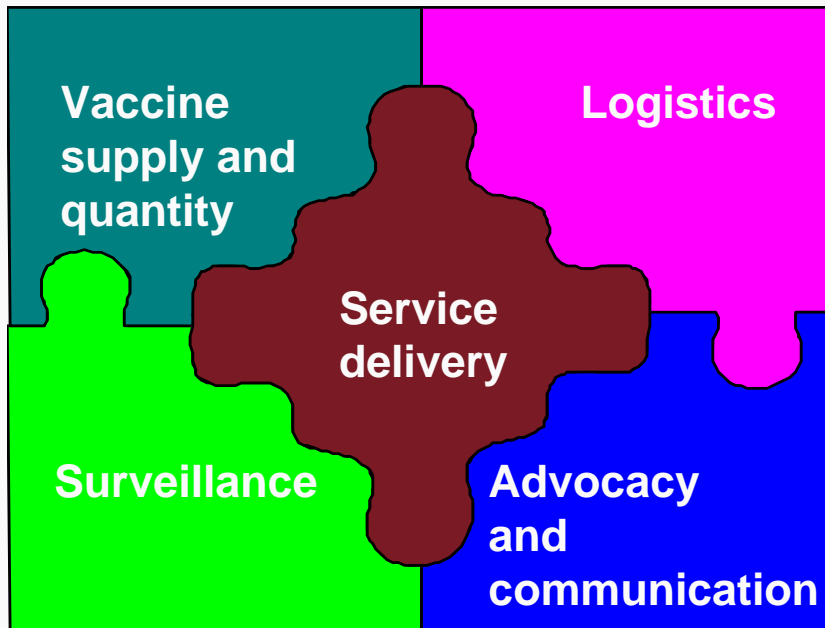


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Delivery Strategies, Cold Chain, and Logistics

Michael J. McQuestion, PhD, MPH
Johns Hopkins University

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Section A

Components of a Vaccine Delivery System

Components of a Vaccine Delivery System

- Strategies for hard-to-reach populations
- Vaccine and surveillance logistics
- Injection safety
- Cold chain
- Data quality
- These components characterize every vaccination program
- Programs in the U.S. and developing countries use different strategies to achieve them
- Over time, the strategies are converging

Vaccine Delivery in the U.S.

- Vaccines are delivered routinely through a mix of public and private fixed facilities
- Traditionally, a state responsibility
- Significant federal inputs (Childhood Immunization Initiative) following 1991 measles epidemic
- Private insurance: covers 60% of children ages 0–5, but only half cover vaccines
- HMOs: give about 25% of all U.S. child immunizations; virtually all cover vaccines
- Vaccines for Children Program (1994–present)
 - Gives free vaccines to 35% of all infants
 - 1/3 of providers are public, 2/3 private

Vaccine Delivery in the U.S.

- High-risk groups least likely to be immunized
 - Inner-city neighborhoods
 - Low-income
 - Uninsured
 - Racial and ethnic minorities
- Vaccines: federal (CDC) purchasing and safety oversight
- Specimens: CDC, state laboratories
- Cold chain: vaccines, drugs fully integrated
- Data quality: standard CDC supervision protocols, provider and state registries

Three Healthy People 2010 (U.S.) Vaccination Objectives

- 1.** Achieve immunization coverage of at least 90% among children 12–23 months
- 2.** Ensure that all states reach at least 90% immunization coverage among children 19–35 months
- 3.** Increase to 90% the number of children 24–35 months receiving vaccinations as part of comprehensive health care

- The U.S. vaccination system must improve its performance in order to accomplish these and other objectives

- Based on an extensive literature review, the Task Force on Community Preventive Services (Briss et al 2000) recommended interventions for improving vaccine delivery
- They fall into three categories
 1. Increasing community demand:
 2. Enhancing access to vaccines
 3. Provider-based interventions



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Section B

Recommendations and Strategies

Recommendations of the Task Force

- 1.** To increase community demand
 - Client reminder-recall methods
 - Mass media, community education
 - School immunization requirements

Source: Task Force on Community Preventive Services, 2000

Recommendations of the Task Force

- 2.** To increase access to immunizations
 - Reduce out-of-pocket costs
 - Increase clinic hours, convenience
 - Link to other programs
 - Home visits

Source: Task Force on Community Preventive Services, 2000

Recommendations of the Task Force

- 3.** To improve provider efficiency
 - Provider reminder-recall methods
 - Periodic assessment, feedback
 - Standing orders

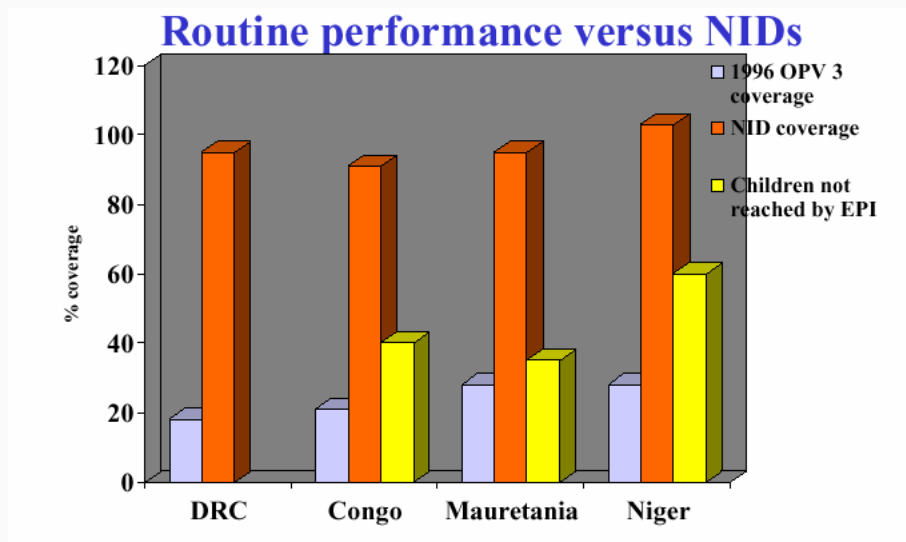
Source: Task Force on Community Preventive Services, 2000

Recommendations of the Task Force

- The optimal intervention mix
 - Depends on local conditions
 - Could add 16% to current coverage
 - Combines two or more interventions
- We will learn more about them later in the course

Developing World Vaccine Delivery Strategies

- Routine fixed facility services
- Campaigns: national immunization days
- Sustained outreach services
- Containment and mop-up



▼ Notes Available

Source: WHO

- People don't want to go to health services
 - Insufficient quality
 - Operational constraints: transport, cold chain
 - Irregular service
 - Staff attitudes
 - Fees, etc. (provider, client, health service triangle)

Source: WHO

Developing World: Vaccine and Surveillance Logistics

- Transport management
- Computer-assisted stock control
- Specimens: reverse cold chain
- Data: collection and prompt feedback

- Syringe, needle technology: must maximize sterile technique, minimize needle-stick injuries
 - Reusable -> steam sterilization
 - Auto-destruct -> safe disposal needed
 - Pre-filled -> safe disposal needed
 - Jet injectors -> not yet feasible

- Disposal technology
 - Integrate syringe, needle destruction with disposal of other medical wastes
 - Must incinerate sharps (needles) and softs (bandages)
 - Adverse events reported, investigated

Elements of a Cold Chain

- *Central cold room:* store national supply
- *Other large equipment:* regional cold rooms, freezers, refrigerators
- *Small equipment:* cold boxes, vaccine carriers, ice packs, thermometers, vaccine vial monitors (vaccination centers)

The "Fast" Cold Chain

- Problem: distribute viable vaccines as far from the routine cold chain as possible
- Useful for eradication efforts
- Consists of vaccine boxes, carriers, ice packs and vaccine vial monitors

- After finishing this lecture, please visit the following link for a cold chain vignette from West Africa:

<http://seattlepi.nwsource.com/africa/infographics/coldchainjourney.asp>



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Section C

Data Quality

- Countries cannot depend forever on DHS, other surveys for reliable vaccine coverage estimates
- Donors need to know reported data validity
- Solution: Data Quality Audit (DQA)
 - Assess reporting system
 - Identify remedial action

- Two internal, two external team members visit a sample of 24 health units, 4 districts, and national EPI offices (2 weeks)
- DTP3 coverage, dropout rates, district reporting: key EPI performance indicators
- Result: monitoring/reporting system assessment, DPT3 coverage audit

Example of a DQA Measure: National Quality Index Score

- Five components
 1. Recording practices
 2. Data storing, reporting
 3. Monitoring, evaluation
 4. Denominators
 5. System design

Two Sample Indicators

- Two sample indicators used in the scoring of “recording practices” at national level
 - **Indicator #1:** is the current ledger book up-to-date for DTP vaccine?
 - ▶ (Up-to-date= all receipts and issues entered within 24 hours)
 - **Indicator #2:** does each report from the audit year received from the four selected districts have the date of receipt stamped or written on it by the national office?
 - ▶ (If >50% of the four selected districts, score “yes”; if <100%, discuss need to have dates, check other reports awaiting processing)

DQA Quality Index Score

- Similar indicators are measured at national, district, and health unit levels for all DQA measures
- Results are tabulated, adjusted for the level of errors, and summarized in a series of Excel tables and charts

Problems Commonly Encountered at all Levels

- Organization, filing, and storage of reports
- Electronic data storage
- Dating and signing reports
- Keeping records up to date
- Report completeness
- Analysis of EPI data and provision of feedback
- Report timeliness
- Dissemination of EPI policies and use of guidelines

Source: GAVI

- Join TechNet at:
<http://www.technet21.org/>

- We have considered the first three steps of the problem-solving paradigm
 - Define problem
 - Measure its magnitude
 - Conceptualize its determinants
 - Strategize interventions
 - Implement and evaluate
- Now let's consider the next two steps by applying them to common vaccine delivery problems

- Consider the Task Force on Community Preventive Services review as a problem-solving exercise
- Let's analyze its approach for one intervention area: client reminder-recall methods

Problem Solving: Patient Recall-Reminders

- Problem definition
 - Parents forget which vaccinations their children need—and when they need them
- Magnitude
 - 12% of potential coverage
- Determinants
 - Complexity of vaccination schedule (cause)
 - Provider willingness to send reminders
 - Technique, content of messages

Problem Solving: Patient Recall-Reminders

- Strategize interventions
 - Phone contact vs. letter vs. postcard
 - ▶ Personal
 - ▶ Computerized
 - Message content, intensity
 - ▶ Specific (Child x, Vaccine y, on Date z)
 - ▶ General (neutral, state risks, appeal to parental responsibility, etc.)

Problem Solving: Patient Recall-Reminders

- Implement and evaluate
 - 42 studies judged methodologically adequate
- Conclusions
 - Phone, letter, postcard equally effective
 - Intense messages get best response
 - Cost-effective: \$9/vaccination

Case Studies in Problem-Solving Vaccine Delivery

- Most of the time, managers and vaccine providers face a specific problem with multiple causes
- The problem-solving paradigm is one tool they can use

- Vaccine delivery systems are complex and must meet exacting technical standards
- DC, LDC vaccine delivery systems are converging due to new technologies
- As they advance, vaccination program performance increasingly depends on the ability to solve management-related problems