



HEALTH

- THE ARTS
- CHILD POLICY
- CIVIL JUSTICE
- EDUCATION
- ENERGY AND ENVIRONMENT
- HEALTH AND HEALTH CARE
- INTERNATIONAL AFFAIRS
- NATIONAL SECURITY
- POPULATION AND AGING
- PUBLIC SAFETY
- SCIENCE AND TECHNOLOGY
- SUBSTANCE ABUSE
- TERRORISM AND HOMELAND SECURITY
- TRANSPORTATION AND INFRASTRUCTURE
- WORKFORCE AND WORKPLACE

This PDF document was made available from www.rand.org as a public service of the RAND Corporation.

[Jump down to document](#) ▼

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world.

Support RAND

[Browse Books & Publications](#)

[Make a charitable contribution](#)

For More Information

Visit RAND at www.rand.org

Explore [RAND Health](#)

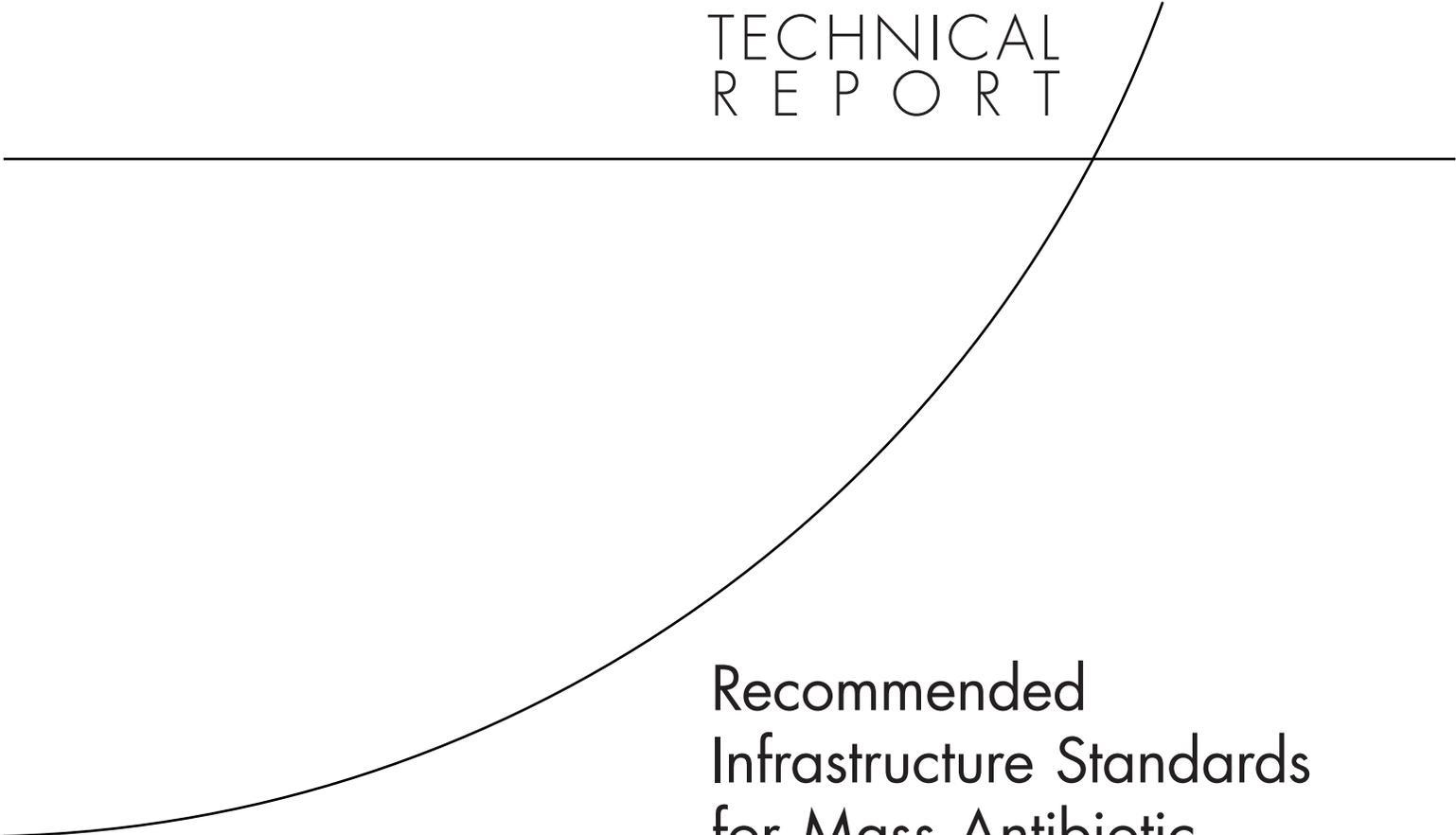
View [document details](#)

Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Unauthorized posting of RAND PDFs to a non-RAND Web site is prohibited. RAND PDFs are protected under copyright law. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please see [RAND Permissions](#).

This product is part of the RAND Corporation technical report series. Reports may include research findings on a specific topic that is limited in scope; present discussions of the methodology employed in research; provide literature reviews, survey instruments, modeling exercises, guidelines for practitioners and research professionals, and supporting documentation; or deliver preliminary findings. All RAND reports undergo rigorous peer review to ensure that they meet high standards for research quality and objectivity.

TECHNICAL
R E P O R T



Recommended Infrastructure Standards for Mass Antibiotic Dispensing

Christopher Nelson, Edward W. Chan, Anita Chandra,
Paul Sorensen, Henry H. Willis, Katherine Comanor,
Hayoung Park, Karen A. Ricci, Leah B. Caldarone,
Molly Shea, John A. Zambrano, Lydia Hansell

Sponsored by the Department of Health and Human Services

This work was sponsored by the Department of Health and Human Services and was carried out within the RAND Health Center for Domestic and International Health Security. RAND Health is a division of the RAND Corporation.

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

RAND® is a registered trademark.

© Copyright 2008 RAND Corporation

All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from RAND.

Published 2008 by the RAND Corporation
1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1200 South Hayes Street, Arlington, VA 22202-5050
4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213-2665
RAND URL: <http://www.rand.org>
To order RAND documents or to obtain additional information, contact
Distribution Services: Telephone: (310) 451-7002;
Fax: (310) 451-6915; Email: order@rand.org

PREFACE

Since 2001, the U.S. government has spent over \$7 billion to enhance the ability of the nation's state and local public health infrastructure to prevent, prepare for, respond to, and recover from the health consequences of bioterrorism attacks, natural disasters, disease outbreaks, and other public health emergencies. The ability to distribute antibiotics and other life-saving medical countermeasures to entire communities in a short period of time has been identified by policymakers as among the most essential components of public health emergency preparedness.

This document presents a set of recommended standards for mass antibiotic dispensing that focus on the "points of dispensing" (or PODs, locations where the members of the public would go to receive life-saving antibiotics or other medical countermeasures during a large-scale public health emergency). Specifically, the standards address (1) the number and location of PODs, (2) internal POD operations, (3) POD staffing, and (4) POD security. This document will be of interest to policymakers and practitioners involved in public health emergency preparedness at all levels of government.

The recommended standards are based on available empirical evidence, computer models, and the experience and consensus of expert practitioners. Given the weakness of existing evidence and tools, as well as the occasional difficulty in developing expert consensus, this report offers alternate versions of some standards. In these instances, policymakers must use their judgment in selecting among the alternatives.

This work was sponsored by the U.S. Department of Health and Human Services Office of the Assistant Secretary for Preparedness and Response (HHS ASPR) and was carried out between October 2006 and December 2007 within the RAND Health Center for Domestic and International Health Security. RAND Health is a division of the RAND Corporation. A profile of the center, abstracts of its publications, and ordering information can be found at www.rand.org/health/centers/healthsecurity. More information about RAND is available at our Web site at <http://www.rand.org>.

CONTENTS

Preface.....	iii
Figures.....	ix
Tables.....	xi
Tools.....	xiii
Summary.....	xv
Acknowledgments.....	xxiii
Abbreviations.....	xxv
1. INTRODUCTION.....	1
Overview.....	1
Focus of Recommended Standards.....	1
Recommended Standards Were Developed for the Cities Readiness Initiative.....	2
Recommended Standards Focus on Infrastructure for Points of Dispensing.....	6
Recommended Standards Are Aligned with the CRI 48-Hour Goal.....	7
Recommended Standards Were Developed in Collaboration with Federal, State, and Local Agencies.....	7
Organization of This Report.....	8
2. APPROACH TO STANDARDS DEVELOPMENT.....	9
Overview.....	9
Method.....	9
Analysis Relied on Multiple Data Sources.....	9
Standards Development Process Involved Extensive Consultation with Stakeholders.....	11
Construction of Recommended Standards Sought to Balance Evidence, Consistency, and Flexibility.....	13
Expert Panel and Preliminary Analysis Argued for Caution in Setting Quantitative Performance Thresholds.....	13
Recommended Standards Provide Flexibility to State and Local Planners.....	14
3. RECOMMENDED STANDARDS ON THE NUMBER AND LOCATION OF PODs.....	17
Overview.....	17
Considerations in Developing Recommended Standards.....	17
Required Number of PODs Depends on per-POD Throughput.....	17
Standard for Travel Distance Might Depend on Population Density.....	18
Trade-Off Between Minimizing Travel Distance and Same-Sized PODs.....	18
Synthesis of Panel Discussion.....	19
Standard 1.1: Determining Demand for PODs.....	20
Explanation.....	20
Suggested Documentation.....	21
Remaining Issues and Options Related to the Standard.....	23
Standard 1.2: Matching POD Supply to Demand.....	24
Explanation.....	24
Suggested Documentation.....	26
Remaining Issues and Options Related to the Standard.....	27
Standard 1.3: Minimal Requirements for POD Sites.....	27
Explanation.....	27
Suggested Documentation.....	28
Remaining Issues and Options Related to the Standard.....	28

Additional Location Standards Considered but Ultimately Not Recommended.....	29
Distance Standard Rejected	29
Transit Standard Rejected.....	30
Summary and Conclusions.....	30
4. RECOMMENDED STANDARDS FOR INTERNAL POD OPERATIONS.....	33
Overview	33
Considerations Informing Development of Recommended Standards.....	34
Standard 2.1: Defining Minimal Elements of POD Design	35
Explanation.....	36
Suggested Documentation	38
Remaining Issues and Options Related to the Standard.....	38
Standard 2.2: Addressing Legal and Liability Barriers to Rapid Dispensing.....	39
Explanation.....	40
Suggested Documentation	40
Remaining Issues and Options Related to the Standard.....	41
Standard 2.3: The Need for Flexible and Scalable POD Designs	42
Explanation.....	42
Suggested Documentation	43
Additional Suggestions from Panel Members.....	43
Summary and Conclusions.....	43
5. RECOMMENDED STANDARDS FOR POD STAFFING	45
Overview	45
Considerations Informing Development of Recommended Standards.....	46
Staffing Requirements Depend on the POD Design and Required Throughput	47
Required Throughput at Each POD Depends on the Number and Location of PODs.....	48
Synthesis of Panel Discussion.....	48
Standard 3.1: Estimating the Required Throughput at Each POD	49
Recommended Standard	49
Explanation.....	49
Suggested Documentation	50
Remaining Issues and Options Related to the Standard.....	50
Standard 3.2: Estimating the Staff Required and Throughput Achievable at PODs.....	51
Explanation.....	51
Procedures for Meeting the Standard.....	52
Suggested Documentation	54
Planning for “Buffer” Staff.....	55
Remaining Issues and Options Related to the Standard.....	56
Standard 3.3: Recruiting Sufficient Staff for PODs	56
Explanation.....	57
Suggested Documentation	58
Standard 3.4: Assessing Availability of POD Staff.....	58
Explanation.....	58
Suggested Documentation	59
Remaining Issues and Options Related to the Standard.....	59
Summary and Conclusions.....	60
6. RECOMMENDED STANDARDS ON POD SECURITY	61
Overview	61
Considerations Informing Development of Recommended Standards.....	61
Jurisdictions Vary in Reliance on Sworn Law Enforcement	62
Approaches to Security Must Be Aligned with Availability of Security Personnel	63
Synthesis of Panel Discussion.....	65
Standard 4.1: POD Site Security Assessments.....	65

Explanation.....	65
Suggested Documentation	66
Remaining Issues and Options Related to the Standard.....	67
Standard 4.2: Review of Security Aspects of the Mass Prophylaxis Plan.....	67
Explanation.....	68
Suggested Documentation	68
Remaining Issues and Options Related to the Standard.....	69
Standard 4.3: Presence of Sworn Law Enforcement Officers at Each POD	69
Explanation.....	70
Suggested Documentation	71
Remaining Issues and Options Related to the Standard.....	71
Summary and Conclusion	71
7. NEXT STEPS.....	73
Recommended Next Steps	73
Review the Recommended Standards and Consider Enactment.....	73
Determine Whether Recommended Standards Apply Beyond CRI Awardees.....	74
Ensure Alignment with Other Standards, Guidelines, and Technical Assistance.....	74
Clarify Consequences Attached to Recommended Standards	75
Develop a Process for Routinely Reviewing and Updating Standards	75
Initiate Process for Developing Additional Infrastructure Standards and Standards for Operational Capabilities.....	75
Conclusion	76
Appendixes	
A. INSTRUMENT FOR DATA COLLECTION FROM CRI SITES	77
B. LIST OF PANELISTS.....	87
C. LOCATION MODELING AND ANALYSIS.....	91
D. MODELING AND ANALYSIS OF POD OPERATIONS AND STAFFING	97
REFERENCES.....	103

FIGURES

Figure 1.1: The SNS Process.....3

Figure 2.1: Information Sources for Developing POD Standards10

Figure 3.1: Relationship Between per-POD Throughput and Number of PODs Needed to Serve a
Population of 780,000 in 24 hours.....26

Figure 4.1: POD Steps Used by CRI Awardees35

Figure 5.1: Reducing POD Steps and Medical Training Requirements Reduces Staffing Needs47

Figure 5.2: Staffing Requirements Depend on POD Design and Required Throughput48

Figure 6.1: Variation in Adopted Security Approach by Estimated Availability and Size of Police
Force.....64

Figure C.1: Relationship Between Number of PODs and Average Travel Distances for Three MSAs93

Figure C.2: Two Notional Placements of PODs in an MSA with Varying Population Density.....94

Figure D.1: Flow Diagram for Process Steps Within a Notional POD.....98

TABLES

Table 1.1: CRI Awardees—Table 1 and Table II.....	3
Table 2.1: Timeline of Activities.....	12
Table 2.2: Menu of Standards Types Considered.....	14
Table 5.1: Notional POD Designs	46
Table 6.1: Examples of Approaches Used by Awardees to Provide Security Capabilities at PODs.....	63
Table C.1: Demographic Characteristics of Three Sample CRI Sites	92
Table D.1: Notional POD Designs	100
Table D.2: Assumed Process Times, in Minutes, for Modeled POD Designs.....	100
Table D.3: Statistics Collected for the Percentage of the Population Using Red/Yellow/Green Lines.....	101

TOOLS

Tool 3.1: Sample Spreadsheet for Population Estimates22
Tool 4.1: Documentation for Standard 2.139
Tool 4.2: Checklist of Legal Issues Related to POD Operations.....41

SUMMARY

Since the terrorist attacks in 2001, Congress and the White House have invested over \$7 billion in efforts to upgrade the nation's ability to address the health effects of bioterrorism, natural disease outbreaks, and natural disasters. Despite encouraging anecdotal evidence, however, the absence of performance standards and metrics for preparedness make it difficult to say whether the investments have left the country better prepared.

The Pandemic and All-Hazards Preparedness Act (PAHPA) of 2006 (P.L. 109-417) requires the U.S. Department of Health and Human Services (HHS) to develop evidence-based performance standards and metrics for preparedness and, beginning in 2009, to link funding to state and local agencies to their performance on these standards. As part of its response to the PAHPA legislation, the HHS Office of the Assistant Secretary for Preparedness and Response (ASPR)¹ asked RAND to develop recommended infrastructure standards for mass antibiotic dispensing — specifically for the “points of dispensing” (or PODs, locations where the members of the public would go to receive life-saving antibiotics or other medical countermeasures during a large-scale public health emergency).

HHS asked that the standards

- align with the Cities Readiness Initiative's (CRI's) goal of preparing metropolitan areas to dispense medications to their entire communities within 48 hours of the decision to do so
- focus on PODs — the locations where medications and other countermeasures are to be dispensed to the public — and, more specifically, on the following four areas of POD infrastructure: (1) number and location of PODs, (2) internal POD operations, (3) POD staffing, and (4) POD security.

STANDARDS DEVELOPMENT PROCESS

The rarity of large-scale public health emergencies, while fortunate, means that there is little experience on which to develop standards that are responsive to the PAHPA legislation's mandate that standards be “evidence based.” Thus, the standards must rely on other sources of evidence:

- **data collection and discussions with practitioners**, in order to establish the current baseline level of performance
- **review of existing literature and policy documents**, to help ensure alignment of the standards with other programs

¹ Formerly the Office of Public Health Emergency Preparedness (OPHEP).

- **mathematical modeling of POD operations and locations**, to estimate the relationship between key operational variables and expected performance
- **an expert panel** of key stakeholders and practitioner groups, to ensure that the results of the models are reasonable and to provide guidance on making trade-offs and drafting standards.

The analysis and feedback from expert panelists and stakeholders suggested that several different configurations of POD infrastructure might plausibly lead to the same level of operational output. Thus, one-size-fits-all standards might foreclose viable and innovative approaches.² The recommended standards seek to provide flexibility to state and local CRI planners in how they meet the 48-hour goal.

More details on the considerations that informed the development of the standards — including analysis, review of current practice, and consultation with an expert panel — are provided in the body of this report. It also includes (1) recommended documentation requirements that would help federal officials assess compliance with the proposed standards and (2) information on standards considered but not proposed.

Throughout, readers should bear in mind that the standards proposed in this report are *not* intended to cover all aspects of infrastructure that must be addressed in POD plans. Consequently, it is quite possible that a jurisdiction could be fully compliant with all of the proposed standards and still not be able to mount a fully successful response. Moreover, the standards are intended to provide *minimal* requirements and should not discourage CRI sites from exceeding them.

NUMBER AND LOCATION OF PODS

The first set of standards applies to the entire *network* of PODs in a community. Modeling, analysis of current practice, and members of the expert panel suggested that the optimal number of PODs depends strongly on other planning factors (e.g., throughput) and on community context (e.g., population density, transportation infrastructure, availability of sites). Thus, instead of providing strict numerical targets in terms of the number of PODs, the standards outline a clear and auditable process for determining the appropriate number of PODs in a specific community.

Standard 1.1: The jurisdiction shall estimate the number of people who will likely come to PODs to pick up medication, along with their geographic distribution.

To ensure that the number of PODs is sufficient to provide initial prophylaxis within 48 hours, it is first necessary to develop an accurate estimate of the size of the population to be served via PODs. Thus,

² Note that the difficulty in developing clear infrastructure standards is one of the reasons for our recommendation that HHS move next to develop standards around operational capabilities (see Chapter Seven). The idea would be to insist that jurisdictions be able to meet certain operational goals and timelines using whatever infrastructure configurations can achieve those goals effectively and reliably.

Standard 1.1 requires that CRI sites provide a systematic analysis of likely demand for PODs, including both the *total number* of likely POD visitors and their *geographic distribution*. The standard assumes that individual jurisdictions are in the best position to define the scope of the population for whom they will be responsible for administering prophylaxis.

Standard 1.2: The number of PODs shall be greater than or equal to the number of persons needing to receive prophylaxis at PODs divided by per-POD throughput multiplied by 24 hours (48 hours minus 12 hours for initial CDC delivery to warehouse and 12 hours to get materiel from warehouse to PODs).

Standard 1.2 requires jurisdictions to combine the population analysis developed pursuant to Standard 1.1 with estimates of hourly POD throughput in order to ensure that the *supply* of PODs matches demand. Specifically, the following relationship among these four factors must hold:

$$\text{Number of PODs} \geq \frac{\text{Population visiting PODs in person}}{\text{Hourly per - POD throughput} \times 24 \text{ hours}} .$$

The estimate of 24 hours for POD operations (in the denominator) is based on the assumption by the Centers for Disease Control and Prevention (CDC) that it might take up to 12 hours for initial delivery of materiel from the Strategic National Stockpile (SNS) and the Target Capabilities List's (TCL's) assumption that it might take up to 12 hours to get materiel from warehouse to PODs.

Standard 1.3: All POD locations shall meet relevant SNS site guidelines and security criteria.

Standard 1.3 specifies that planned POD locations shall meet the basic site and infrastructure requirements in the SNS program guidance. The standard refers to the facility requirements written into the SNS program guidance (currently version 10.02) in order to avoid unnecessary duplication of effort.

INTERNAL POD OPERATIONS

In routine circumstances POD operations might prioritize accuracy over speed and include a broad range of functions (e.g., thorough client education, detailed screening for contraindications). The requirements of a large-scale emergency, especially the need to serve a large number of clients, may require reducing the amount of time spent with each client and reducing staff requirements for formal medical training. Thus, the next set of standards concerns the internal operations that must take place at PODs.

Standard 2.1: Jurisdictions shall have at least one viable and exercised rapid-dispensing³ protocol. For the purposes of this standard, a rapid-dispensing protocol is one in which the following functions are provided by means that minimize the need for medically licensed personnel at the POD sites:

- **directing clients through the POD**
- **deciding which medication to dispense**
- **disseminating information about the medication**
- **dispensing the medication.**

Such means might include, but are not limited to, information campaigns to educate the public before arrival at the POD, signage and automated messages at the POD, and standing protocols so that non–medically licensed personnel can perform POD functions.

A common theme in panel discussions was that POD protocols must be appropriate to the specific circumstances at hand. Accordingly, less elaborate dispensing protocols are not only appropriate but are required in situations necessitating full-community prophylaxis in a short time period. Thus, Standard 2.1 requires jurisdictions to develop and exercise at least one POD protocol in which many traditional POD functions are performed by non–medically licensed personnel or outside the POD entirely to reduce the number of staff required at the POD and increase POD throughput.

Standard 2.2: Jurisdictions shall ensure that legal and liability barriers to rapid dispensing are identified, assessed, prioritized, and communicated to those with the authority to address such issues. Such issues include standards of care, licensing, documentation of care, civil liability for volunteers, compensation for health department staff, rules governing the switch between dispensing protocols, and appropriation of property needed for dispensing medications.

The POD protocols governing the provision of medication to an entire metropolitan area within 48 hours (e.g., relaxed screening and recordkeeping requirements, use of non–medically trained personnel) might conflict with routine legal strictures. Thus, Standard 2.2 requires that jurisdictions work with relevant state and local authorities to ensure that they have the legal authority to operate rapid-dispensing PODs during a public health emergency. Note that the standard does not require CRI sites or other health departments to change laws — only to “identify, assess, prioritize, and communicate” such issues to those who do have the authority to change them.

Standard 2.3: Jurisdictions shall have viable and exercised procedures for selecting an appropriate dispensing protocol (e.g., medical model versus rapid dispensing).

While the need to provide prophylaxis to an entire metropolitan area within 48 hours argues for streamlined, rapid-dispensing protocols, changing circumstances might require more time, skill, and

³ *Rapid dispensing POD* is the term used in the CDC Division of the Strategic National Stockpile (DSNS) Technical Assistance Review (TAR) tool.

attention to be applied to each client. For instance, as jurisdictions move out of the initial 48-hour period, further epidemiological investigation might suggest follow-up prophylaxis of only a limited portion of the population. This and other changes in the situation might necessitate a different balance between dispensing speed and screening accuracy. Thus, Standard 2.3 requires that jurisdictions have clear procedures for moving to and from streamlined prophylaxis operations.

POD STAFFING

Perhaps the most difficult aspect of conducting a mass prophylaxis operation in the CRI scenario is having sufficient staff to operate the PODs. As with the other sets of standards, the standards development process revealed concern that uniform, one-size-fits-all staffing standards would fail to account for community differences, unnecessarily require jurisdictions to undo work already completed, and stifle innovation. Thus, instead of providing strict numerical staffing targets, the next set of standards requires jurisdictions to undertake a clear and auditable process to determine appropriate staffing configurations.

Standard 3.1: Jurisdictions shall estimate the number of individuals who are likely to visit each POD location and determine the required hourly throughput at each POD.

The first step in determining the staffing required for PODs is to determine the throughput that will be required at each POD. Thus, Standard 3.1 requires an estimate of the number of people who will likely come to *each* POD seeking prophylaxis. It should be noted that the standard does *not* require individuals to be assigned to particular PODs to pick up their medications; it only requires that jurisdictions' plans be based on *estimates* of the number of individuals *likely* to come to each POD.

Standard 3.2: Jurisdictions shall determine and verify the number of staff required to administer prophylaxis to their identified population (identified pursuant to Standard 1.1) by conducting drills with time studies.

Standard 3.2 requires jurisdictions to estimate staffing requirements for each POD, given estimated throughput requirements (see Standard 3.1). Jurisdictions are instructed to conduct POD drills, measuring the throughput of the POD *and* timing the operations of each of the different stations in the POD.

Standard 3.3, Alternative 1: Jurisdictions shall recruit sufficient staff to operate all the planned PODs in the jurisdiction at the levels of throughput required to meet the CRI timeline.

Standard 3.3, Alternative 2: Jurisdictions shall recruit sufficient core staff and provide plans for recruiting and training spontaneous, unaffiliated volunteers in sufficient numbers to operate all the planned PODs in the jurisdiction at the levels of throughput required to meet the CRI timeline.

Standard 3.3 requires jurisdictions to identify and recruit the staff necessary to implement their mass prophylaxis plan and enter them into a call-down roster. The standards development process revealed concerns about the burden – especially for large jurisdictions – of recruiting and maintaining call-down lists for what might be a very large number of staff (over 6,000 in some metropolitan statistical areas [MSAs]).

Given that there was neither a clear analytical basis nor consensus on how to address this concern, we present two alternatives for consideration.

Standard 3.4, Alternative 1: Jurisdictions shall assess the availability of all staff on their call-down rosters on a quarterly basis via a no-notice call-down drill.

Standard 3.4, Alternative 2: Jurisdictions shall assess the availability of the core staff on their call-down rosters on a quarterly basis via a no-notice call-down drill.

Standard 3.4 requires that jurisdictions demonstrate via quarterly no-notice call-down drills that they can promptly contact and assemble the required number of people to staff PODs within the first few hours of the decision to conduct mass prophylaxis operations. As with Standard 3.3, the standards development process revealed concerns about the burdens (especially in large MSAs) of testing extremely large call-down lists (over 6,000 for some MSAs). Again, given that there was neither a clear analytical basis nor consensus on how to address this concern, we present two alternative standards.

POD SECURITY

Adequate security planning is essential to the safety of POD staff and clients, the sustainability of operations, and the safeguarding of countermeasures being dispensed. The main challenge in developing appropriate standards for POD security is to ensure that a comprehensive set of security measures is in place while recognizing that state and local law enforcement agencies often have policies, procedures, and doctrine for performing many of these tasks. Thus, the proposed POD security standards favor flexible approaches over strict numerical thresholds.

Standard 4.1: Site security assessments shall be conducted at every POD location in coordination with the agency or agencies responsible for security functions at the PODs.

Discussions with the expert panel and security experts suggested that security assessments be conducted on every potential POD facility and that effective security requires collaboration between the public health and public safety communities. Thus, Standard 4.1 requires site assessments for each facility, coordinated with the agency or agencies responsible for security functions at the PODs (which, in most cases, will be the local law enforcement agency).

Standard 4.2, Alternative 1: The agency or agencies responsible for security functions at PODs shall be consulted on *and approve* the security aspects of the overall mass prophylaxis plan.

Standard 4.2, Alternative 2: The agency or agencies responsible for security functions at PODs shall be consulted on the security aspects of the overall mass prophylaxis plan.

Discussions with expert panel members and security experts emphasized that effective security planning requires consultation with the parties responsible for security at PODs (whether law enforcement or otherwise) regarding the development of the POD plan. There was some discussion among expert panel members as to whether the standard should also require simple consultation with or formal approval by the

agency or agencies responsible for security functions. Lacking either consensus among panel members or any evidence base to sway the decision, we present two alternatives for consideration by decisionmakers.

Standard 4.3, Alternative 1: Law enforcement in the form of sworn, uniformed officers shall maintain a physical presence at each POD location.

Standard 4.3, Alternative 2: Law enforcement in the form of sworn, uniformed officers shall maintain a physical presence at each POD location. This requirement may be waived with a written attestation from the parties responsible for POD security. The attestation shall include evidence that compliance with the standard as written is infeasible and that alternate measures designed to ensure adequate security are in place at each POD site.

A survey of current security practices adopted by CRI sites indicates that many of the security tasks required at a POD facility can be provided by trained volunteers, private security, or other personnel besides sworn law enforcement officers. However, the expert panel emphasized the need for some level of sworn law enforcement presence at each facility because some tasks (e.g., making arrests, integration with the law enforcement command structure) cannot be delegated. Thus, Standard 4.3 requires the physical presence of law enforcement at each POD. However, there was serious concern among some panelists and stakeholders that this requirement would be infeasible in some jurisdictions. Thus, an alternate version of the standard includes a provision for waiving the requirement for *physical* presence.

NEXT STEPS

The standards presented in this report are intended as proposals. A number of steps will be required to finalize and adopt them. Policymakers should

- review the recommended standards and consider enactment
- weigh the policy issues underlying the cases for which we have presented alternate versions of standards
- determine whether standards apply beyond CRI awardees
- initiate and complete the process for developing standards for *operational capabilities*⁴ within the next year
- ensure alignment with other standards, guidelines, and technical assistance
- clarify the consequences attached to standards
- develop a process for routinely reviewing and updating standards.

⁴ Operational capabilities involve the ability to translate capacities (e.g., plans, people, equipment, other resources or infrastructure) into real operational outputs.

ACKNOWLEDGMENTS

This project could not have been completed without the efforts of a large number of individuals. First and foremost, we thank the members of the expert panel for their dedication to process and for their insightful contributions. We also thank the many officials in state and local health departments across the country who, while not on the panel, nonetheless shared valuable information about mass dispensing and provided valuable feedback on draft standards. Our project officers at HHS — William Raub, Matthew Minson, and Lara Lamprecht — provided support, guidance, and insight at all stages of the project. We also acknowledge Stephanie Dulin and CDR Patricia Pettis of the U.S. Public Health Service at CDC, who provided invaluable assistance in framing and carrying out the standards development process. Finally, we thank Jeffrey Wasserman, Nicole Lurie, Nathaniel Hupert, Susan Allan, and Tom LaTourrette for their in-depth reviews of this document.

ABBREVIATIONS

ASPR	Office of the Assistant Secretary for Preparedness and Response
CDC	Centers for Disease Control and Prevention
CRI	Cities Readiness Initiative
DHS	U.S. Department of Homeland Security
DSNS	Division of the Strategic National Stockpile
GIS	geographic information system
GPS	Global Positioning System
HHS	U.S. Department of Health and Human Services
MSA	metropolitan statistical area
MSHEP	Model State Health Emergency Powers Act
OPHEP	Office of Public Health Emergency Preparedness
PAHPA	Pandemic and All Hazards Preparedness Act
POD	Point of Dispensing
RSS	receiving, staging, and storing
SNS	Strategic National Stockpile
TAR	Technical Assistance Review
TCL	Target Capabilities List
USPS	U.S. Postal Service

1. INTRODUCTION

OVERVIEW

The 2001 anthrax attacks, the 2005 Gulf Coast hurricanes, and the continuing threat of an avian flu pandemic have pushed public health emergency preparedness to the top of the national agenda.

Accordingly, Congress and the White House have invested over \$7 billion since the 9/11 attacks in efforts to upgrade the nation's ability to address bioterrorism, natural disease outbreaks, and the health effects of natural disasters.

Despite encouraging anecdotes, the absence of performance standards and metrics for preparedness make it difficult to say whether the investments have left the country better prepared. The Pandemic and All-Hazards Preparedness Act (PAHPA) of 2006 (P.L. 109-417) seeks, among other things, to increase accountability for federal preparedness dollars by requiring the Department of Health and Human Services (HHS) to develop evidence-based benchmarks and objective standards and metrics for preparedness and, beginning in 2009, to link state and local agencies' funding to their performance on these standards.⁵

As part of its response to the PAHPA legislation, the HHS Office of the Assistant Secretary for Preparedness and Response (ASPR)⁶ asked RAND to develop recommended infrastructure standards for mass antibiotic dispensing, specifically for the points of dispensing (or PODs, locations where the members of the public would go to receive life-saving antibiotics or other medical countermeasures during a large-scale public health emergency). Countermeasure dispensing is one of the primary public health preparedness priorities identified by the *National Preparedness Goal* (DHS, 2005).⁷

FOCUS OF RECOMMENDED STANDARDS

HHS asked RAND to keep the following objectives in mind when developing the standards:

- The standards should focus on capacities that awardees under the Cities Readiness Initiative (CRI) are expected to be developing.
- The initial set of standards should focus on PODs, the locations where medications and other countermeasures are to be dispensed to the public.

⁵ See Canada (2003) for a broader discussion of federal approaches to encouraging changes in programmatic behavior at the state and local level.

⁶ Formerly the Office of Public Health Emergency Preparedness (OPHEP).

⁷ The *National Preparedness Goal* responded to Homeland Security Presidential Directive 8, which called for identification of the top national homeland security priorities. The other priorities are as follows: (1) expand regional collaboration; (2) implement the National Incident Management System; (3) implement the National Infrastructure Protection Plan; (4) strengthen information sharing and collaboration capabilities; (5) strengthen chemical, biological, radiological, nuclear, and explosive detection, responses, and decontamination capabilities; and (6) strengthen emergency operations planning and citizen protection capabilities (Bush, 2003).

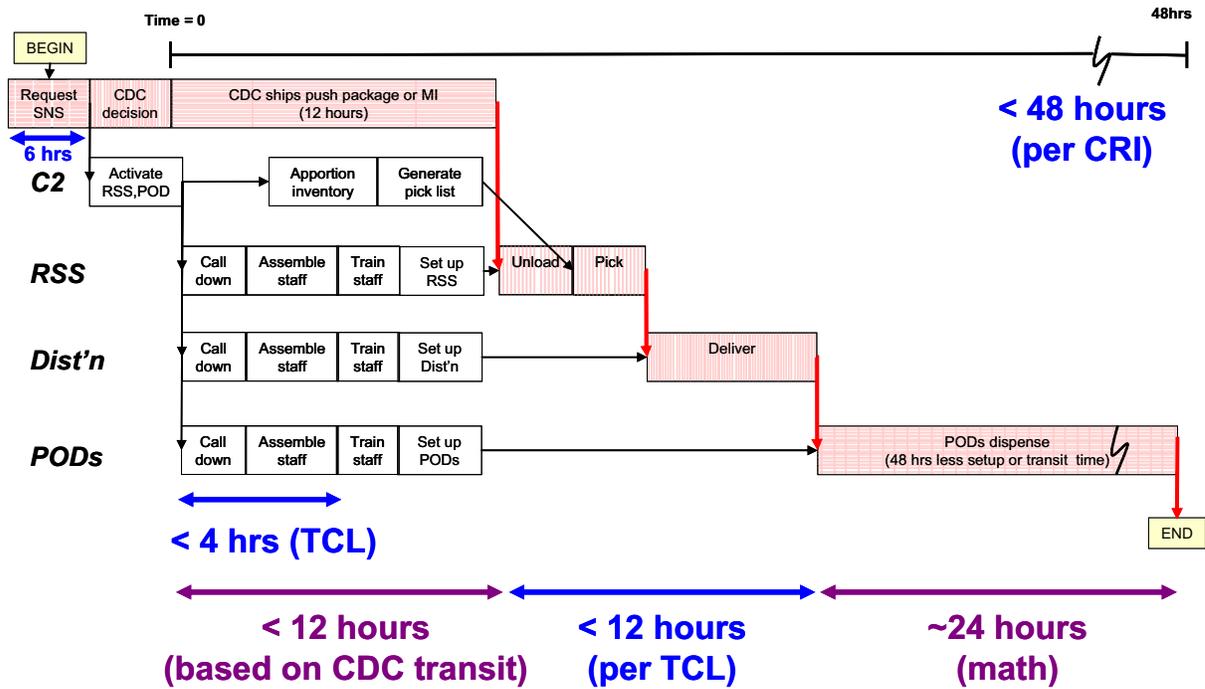
- The standards should focus on POD infrastructure — including the number and location of PODs, internal POD design and operations, POD staffing, and POD security — and should be aligned with the CRI program’s goal of full-community prophylaxis within 48 hours of the decision to do so.
- The standards development process should proceed in collaboration with HHS ASPR, the Centers for Disease Control and Prevention (CDC) Division of the Strategic National Stockpile (DSNS), and state and local agencies that are current CRI awardees.

We discuss each of these issues in turn.

Recommended Standards Were Developed for the Cities Readiness Initiative

HHS asked that the standards focus on capacities that CRI awardees are expected to be developing. CRI, which began in 2004 amid heightened concerns about large-scale bioterrorist attacks, seeks to improve the ability of the nation’s largest metropolitan areas to distribute medical countermeasures rapidly to their entire populations. The CRI program builds upon the previously enacted Strategic National Stockpile (SNS) program, which involves caches of antibiotics, antivirals, airway supplies, and other countermeasures maintained at undisclosed locations around the United States and available through contingency contracts with suppliers.

Although SNS resources are procured and maintained by the federal government, responsibility for requesting, receiving, distributing, and dispensing countermeasures to the public lies with state and local officials. CDC DSNS can deliver an initial shipment of resources anywhere in the United States within 12 hours of a request from a governor or state health official. Figure 1.1 provides a simplified representation of the SNS process, beginning with a request and ending with the dispensing of medication to individuals.



NOTE: C2=command and control. RSS=receiving, staging, and storing. TCL=target capabilities list.

Figure 1.1: The SNS Process

Initially, the CRI program funded 21 pilot cities. During the second year, the program expanded to include the entire metropolitan statistical areas (MSAs) of each of the 21 pilot cities and included an additional 15 MSAs. Collectively, these 36 MSAs are known as the “Table I awardees.” More recently, the program expanded again to include 36 “Table II awardees” (see Table 1.1).

Table 1.1: CRI Awardees—Table 1 and Table II

Table 1 Awardees	
Arizona	Phoenix-Mesa-Scottsdale, AZ
California	Riverside-San Bernardino-Ontario, CA
California	Sacramento-Arden-Arcade-Roseville, CA
California	San Diego-Carlsbad-San Marcos, CA
California	San Francisco-Oakland-Fremont, CA
California	San Jose-Sunnyvale-Santa Clara, CA
Chicago	Chicago-Naperville-Joliet, IL-IN-WI

Colorado	Denver-Aurora, CO
Delaware	Philadelphia-Camden-Wilmington, PA-NJ-DE
Florida	Miami-Miami Beach-Ft. Lauderdale, FL
Florida	Orlando, FL
Florida	Tampa-St. Petersburg-Clearwater, FL
Georgia	Atlanta-Sandy Springs-Marietta, GA
Indiana	Indianapolis, IN
Los Angeles	Los Angeles-Long Beach-Santa Ana, CA
Maryland	Baltimore-Towson, MD
Maryland	Washington-Arlington-Alexandria, DC-VA-MD
Massachusetts	Boston-Quincy, MA
Michigan	Detroit-Warren-Livonia, MI
Minnesota	Minneapolis-St. Paul-Bloomington, MN
Missouri	St. Louis, MO-IL
Missouri	Kansas City, MO-KS
Nevada	Las Vegas-Paradise, NV
New York City	New York-Northern New Jersey-Long Island, NY-NJ-PA
Ohio	Cincinnati-Middletown, OH-KY-IN
Ohio	Cleveland-Elyria-Mentor, OH
Ohio	Columbus, OH
Oregon	Portland-Vancouver-Beaverton, OR-WA
Pennsylvania	Philadelphia-Camden-Wilmington, PA-NJ-DE
Pennsylvania	Pittsburgh, PA
Rhode Island	Providence-New Bedford-Fall River, RI-MA
Texas	Dallas-Fort Worth-Arlington, TX
Texas	Houston-Baytown-Sugar Land, TX
Texas	San Antonio, TX
Virginia	Virginia Beach-Norfolk-Newport News, VA-NC
Virginia	Washington-Arlington-Alexandria, DC-VA-MD
Washington	Seattle-Tacoma-Bellevue, WA
Washington D.C	Washington-Arlington-Alexandria, DC-VA-MD
Wisconsin	Milwaukee-Waukesha-West Allis, WI

Table II Awardees	
Alabama	Birmingham-Hoover, AL
Alaska	Anchorage, AK
Arkansas	Little Rock-North Little Rock, AR
California	Fresno, CA
Connecticut	Hartford-West Hartford-East Hartford, CT
Connecticut	New Haven-Milford, CT
Delaware	Dover, DE
Hawaii	Honolulu, HI
Idaho	Boise City-Nampa, ID
Illinois	Peoria, IL
Iowa	Des Moines, IA
Kansas	Wichita, KS
Kentucky	Louisville, KY-IN
Louisiana	New Orleans-Metairie-Kenner, LA
Louisiana	Baton Rouge, LA
Maine	Portland-South Portland-Biddeford, ME
Mississippi	Jackson, MS
Montana	Billings, MT
Nebraska	Omaha-Council Bluffs, NE-IA
New Hampshire	Manchester-Nashua, NH
New Jersey	Trenton-Ewing, NJ
New Mexico	Albuquerque, NM
New York	Buffalo-Niagara Falls, NY
New York	Albany-Schenectady-Troy, NY
North Carolina	Charlotte-Gastonia-Concord, NC-SC
North Dakota	Fargo, ND-MN
Oklahoma	Oklahoma City, OK
South Carolina	Columbia, SC
South Dakota	Sioux Falls, SD
Tennessee	Nashville-Davidson-Murfreesboro, TN
Tennessee	Memphis, TN-MS-AR

Utah	Salt Lake City, UT
Vermont	Burlington-South Burlington, VT
Virginia	Richmond, VA
West Virginia	Charleston, WV
Wyoming	Cheyenne, WY

NOTE: Only the largest cities are listed. The table does not include the entire geographical area.

Up to this point, the CRI program has had no explicit performance standards. However, CDC DSNS has employed a series of program assessment tools that, while not explicitly billed as standards, serve to communicate a list of priority activities for awardees. The current assessment tool is known as the Technical Assistance Review (TAR). Most portions of the TAR focus on plans, such as whether public information personnel have been identified and trained. In some cases, the TAR assesses the adequacy of exercises and other tests of operational capability. For instance, the TAR for local health departments assesses whether CRI sites’ “Communication networks (equipment/hardware) between Command and Control locations and support agencies are tested and exercised at least quarterly” (CDC, 2008). However, the TAR seeks only to determine *whether* jurisdictions test their operational capabilities, not *how well* they do on those tests.

Recommended Standards Focus on Infrastructure for Points of Dispensing

While mass prophylaxis is composed of a number of functions, HHS asked that this initial set of standards focus on PODs, the locations where medications and other countermeasures are actually dispensed to the public. PODs are often located in school buildings, community centers, armories, and other large buildings. Alternatively, PODs can be set up at apartment buildings, places of business, or outdoors in parking lots. The recommended standards in this report could apply to any of these POD locations. However, the standards are not intended to apply to non-POD dispensing modalities, including “push” methods of delivery, such as using the U.S. Postal Service (USPS).

HHS also directed that the recommended standards focus on POD *infrastructure*, including

- number and location of PODs
- internal POD design and operations
- POD staffing
- POD security.

The standards were to represent *minimal* requirements and should not discourage CRI sites from exceeding them.

In focusing the standards on infrastructure, HHS recognized that infrastructure is a necessary, but not wholly sufficient, condition of successfully carrying out POD operations. Thus, the infrastructure standards are intended as a prelude to future standards developed around *operational capabilities*, such as

throughput, call-down times, and so on. However, HHS also believed that focusing on infrastructure would have the advantage of allowing the standards to build on existing CRI site practice, which to this point has focused mainly on developing plans and recruiting and training staff. Thus, it was hoped that older, more established, CRI sites could lead the way for newer sites.

That said readers should bear in mind that the standards proposed in this report are *not* intended to cover all aspects of infrastructure that must be addressed in POD plans. For instance, this initial set of standards does not address such critical issues as incident management, tactical communication, and public information and communication.

Consequently, it is quite possible that a jurisdiction could be fully compliant with all of the proposed standards and still not be able to mount a fully successful response. As noted in Chapter Seven, additional standards development efforts will be needed to address these other elements. Conversely, however, a jurisdiction that failed to meet this set of minimal infrastructure standards is unlikely to be able to mount a successful response.

Recommended Standards Are Aligned with the CRI 48-Hour Goal

The CRI program is organized around the planning scenario of an outdoor aerosolized anthrax attack. Anthrax is a particularly challenging scenario because, to be effective, prophylaxis must occur prior to the onset of symptoms. Based on available evidence, it was determined that providing oral antibiotics within 48 hours of exposure would likely prevent 95 percent or more anthrax cases.⁸ Thus, CRI's ultimate goal is that awardee MSAs are able to administer prophylaxis to their entire populations within 48 hours of the decision to do so.

A key requirement for POD infrastructure standards, then, is that compliance with the standards promotes CRI sites' ability to meet the overall 48-hour program goal. Throughout this report, we distinguish between *standards* for specific elements of POD infrastructure and the more general 48-hour *goal* of providing prophylaxis to the entire MSA community.

Recommended Standards Were Developed in Collaboration with Federal, State, and Local Agencies

Finally, HHS directed that the standards development process proceed in collaboration with HHS ASPR, CDC DSNS, and state and local agencies that are current CRI awardees. As such, CDC DSNS collaborated closely in formulation and execution of the project, and HHS ASPR was consulted on a regular basis. Federal, state, and local health officials were represented on an expert panel that was convened to provide guidance on the standards development process, and CRI sites were provided with an opportunity to comment on the draft standards (see Chapter Two for details).

⁸ See Wilkening (2006); Wein, Craft, and Kaplan (2003).

ORGANIZATION OF THIS REPORT

This report provides *recommended* standards for federal decisionmakers. As much as possible, we have sought to make the logic of the recommended standards as transparent as possible so that decisionmakers are able to evaluate and, as appropriate, revise and refine the recommendations. Thus, along with providing the recommended standards, the report also describes options considered but ultimately rejected as well as concerns raised by stakeholders.

The remainder of this report is structured as follows. Chapter Two describes the assumptions and methods used to develop the standards. Chapters Three through Six present and justify standards for the number and location of PODs, internal POD operations, POD staffing, and POD security. Chapter Seven provides recommendations for next steps in the development and implementation of POD standards. Details on technical analyses prepared in developing the standards are provided in appendixes.

2. APPROACH TO STANDARDS DEVELOPMENT

OVERVIEW

As noted in Chapter One, the CRI program is predicated on the goal of ensuring that CRI sites can administer prophylaxis to their entire populations within 48 hours of the decision to do so. The challenge, therefore, is to identify minimal POD infrastructure standards that are likely to ensure that CRI sites are able to meet this goal during a real operation.

In this chapter, we describe the approach used to develop the proposed standards, including the sources that informed our process.

METHOD

Analysis Relied on Multiple Data Sources

The rarity of large-scale public health emergencies, while fortunate, means that there is little experience on which to base judgment of which infrastructure configurations are most likely to leave CRI sites ready to meet the 48-hour goal. This creates a significant barrier to responding to the PAHPA legislation's mandate that standards are evidence based. Thus, the standards must rely on other sources of evidence, as illustrated in Figure 2.1.

Data Collection on Current Practices. The RAND team, working with CDC DSNS regional consultants, solicited and received information on POD infrastructure, plans, and operations from 19 of the 21 original CRI sites (two sites declined to provide data). This information provided a reasonably good picture of current POD practice in the four standards domains (location, operations, staffing, and security) and a helpful baseline for a discussion of standards. This review also helped to identify potential challenges that might impede implementation of the recommended standards. The data-collection instrument is provided in Appendix A.⁹

Consultation with Subject-Matter Experts. The RAND team also discussed POD infrastructure requirements with a number of CRI planners and other subject-matter experts (e.g., operations modelers, engineers) in order to learn more about the thought process that informs plans in their jurisdictions and their practices in addressing POD location, staffing, operational, and security issues.

⁹ Note that the data collected were self-reported and not externally validated.

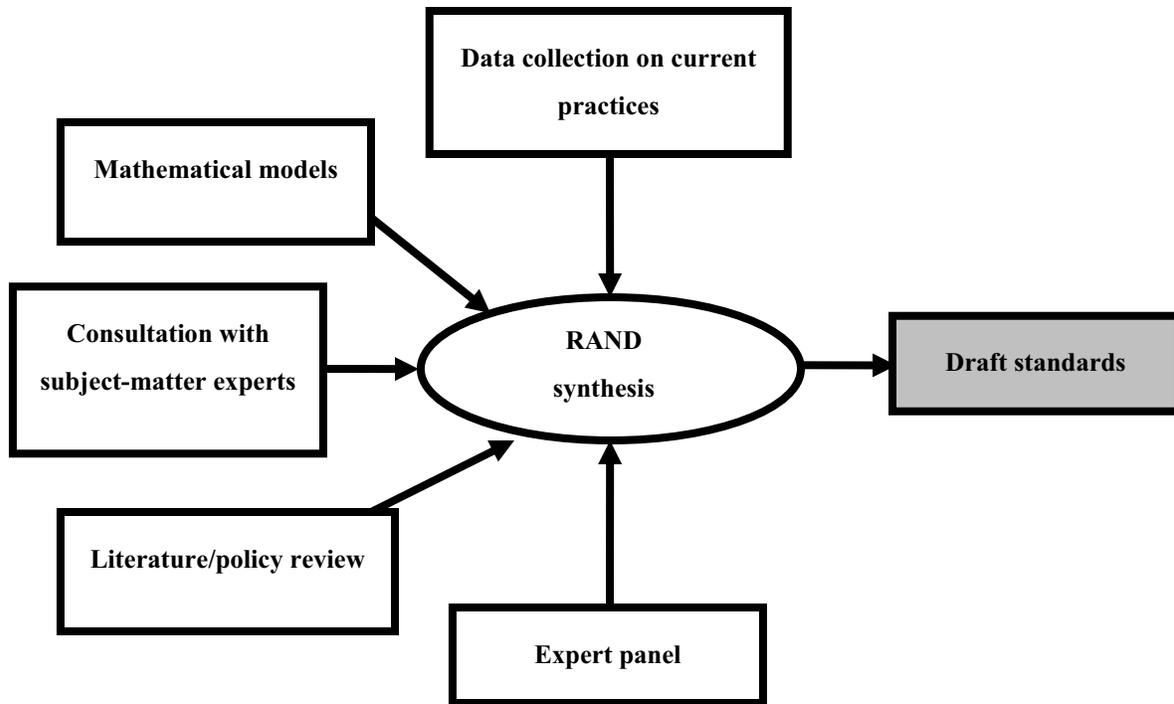


Figure 2.1: Information Sources for Developing POD Standards

Review of Literature and Policy Documents. A review of published literature (e.g., in the areas of public health, emergency management) supplemented the consultations with subject-matter experts. Further, a review of relevant portions of the TCL (DHS, 2007), the *National Preparedness Goal* (DHS, 2005), and other policy documents, was conducted in order to help ensure, as much as possible, alignment of the standards with other programs.

Mathematical Models. The RAND team used mathematical models to estimate the relationship among key infrastructure-related inputs (e.g., staffing), processes (e.g., dispensing tasks), and outputs (e.g., throughput) in order to understand how standards in the domains (e.g., staffing, operations, location) relate to one another and how they might affect operational readiness. For instance, given assumptions about staff productivity and the behavior of individuals (which can be validated through experience), models can provide *approximate* predictions¹⁰ of throughput levels and the likelihood that a jurisdiction can meet the 48-hour goal.¹¹ Wherever possible, these assumptions were grounded in time-and-motion studies and other data collected from CRI sites.

¹⁰ We emphasize that the models' predictions are subject to considerable uncertainty.

¹¹ Given the short project timeline, we relied on existing POD staffing models, including BERM (Weill Medical College, Cornell University) (AHRQ, 2005), Clinic Generator (University of Maryland) (ISR, 2008), and RealOPT (Georgia Institute of Technology) (ISYE, 2006). For POD location, we used standard facility location modeling techniques. Details on the models are provided in Appendix D.

Expert Panel. RAND convened an expert panel to help ascertain the implications of data on current CRI practice, ensure that the results of the models were reasonable, and provide guidance on making trade-offs and drafting standards. Panelists included representatives from federal, state, and local health departments; emergency management organizations; and security agencies. Efforts were made to find panelists with a blend of subject-matter expertise on countermeasure dispensing, practical experience with CRI, and the ability to step back and consider the program from a national perspective. Membership on the panel was jointly determined by RAND and CDC, in consultation with HHS ASPR. Panel members and affiliations are provided in Appendix B.

The two-day panel session was held on April 2007 at RAND's Washington, D.C., office. After an introduction by RAND, CDC DSNS, and HHS ASPR staff, the meeting was organized into separate discussion sessions on internal POD operations, POD staffing, number and location of PODs, and POD security. During each session, panelists received a briefing from RAND staff that summarized the relevant material from a discussion paper circulated ahead of time. This was followed by a semi-structured discussion facilitated by RAND staff. In a few instances, paper-based polls were taken to register opinion. A final session encouraged panelists to reconsider the consensus achieved during each individual session in light of subsequent discussions.

Facilitators sought, but did not require, consensus among panelists. In most instances, sessions ended with a clear majority opinion. In each session, however, there were minority viewpoints that were recorded in the session notes. Significant divergences in opinion are discussed in subsequent chapters.

Standards Development Process Involved Extensive Consultation with Stakeholders

Table 2.1 summarizes the timeline and the main activities of the standards development process. As evident in the table, the process involved extensive consultation with the expert panel and current CRI awardees.

The standards development process began with detailed consultations between RAND and HHS ASPR and CDC DSNS about the scope and methods of the project. After coming to agreement on the details of the project work plan, RAND and CDC DSNS collaborated in developing and fielding the instrument used to collect data on current CRI site practices. These data, along with findings from initial mathematical modeling, were then summarized in a discussion paper designed to frame the expert panel meeting.

Table 2.1: Timeline of Activities

Date	Activity
October – November 2006	Consultation with HHS ASPR and CDC DSNS
December – March 2007	Data collection, modeling of key processes, and development of discussion paper (RAND with CDC)
April 2007	2-day expert panel
May 2007	Consultation with HHS ASPR and CDC DSNS on approach to implementing panel’s recommendations
May – June 2007	Initial draft of standards (RAND)
July – August 2007	Review of draft standards by CDC program staff and expert panel
August – October 2007	Draft standards circulated for review to all 72 CRI sites
October 2007	Consultation about stakeholder feedback with expert panel, HHS ASPR, and CDC DSNS
November 2007	Revisions to standards
March – September 2008	Report reviewed and finalized

After the expert panel, we consulted again with HHS ASPR and CDC DSNS in order to develop a shared understanding of the lessons from the initial data analysis, modeling, and expert panel process. Based on that common vision, RAND staff produced a first draft of the standards. The draft was critiqued by CDC DSNS staff and then by the expert panel. Next, the draft standards were distributed by CDC DSNS to all 72 current CRI sites for review and comment. We received 38 sets of written comments from state and local health departments in 26 states. In order to maximize opportunities for comment, CDC DSNS and RAND also conducted a pair of two-hour teleconference sessions during which CRI sites were invited to offer comments. Taken together, these two sessions were attended by approximately four dozen state and local CRI and SNS officials. We then revised the standards after consulting with key staff from HHS ASPR and CDC DSNS.

Throughout the process, we reviewed input from the expert panel and other stakeholders. We then developed and revised the proposed standards based on this input about how best to weigh competing decision criteria. As described in Chapter One, we also seek in this report to make the recommendations as transparent as possible by presenting alternative viewpoints along with the recommended standards. Thus,

this report is intended to provide a source document, which readers can use to evaluate the recommended standards.

Construction of Recommended Standards Sought to Balance Evidence, Consistency, and Flexibility

A further challenge to the standards development team was to strike an appropriate balance between standardization and flexibility – to reduce unwarranted variation across CRI sites without precluding reasonable adaptations to local context.

On the one hand, uniform and inflexible national standards would be simple and easy to understand. On the other hand, it is well known that there is considerable variation across state and local public health systems and structures (see Turnock and Atchison, 2002; Wasserman et al., 2006). In the absence of a strong evidence base to support a standard or practice, a degree of flexibility in standards might allow jurisdictions to creatively develop solutions and adapt practices to tailor preparedness efforts to best match the characteristics of their community.

In recognition of this dilemma, the RAND team and the expert panel considered a full range of standard types. At one end of the spectrum are strict *numerical* thresholds, which permit little or no flexibility. *Consistency standards*, by contrast, allow jurisdictions considerable flexibility in infrastructure configurations, as long as they are internally consistent (e.g., the number of PODs is compatible with per-POD throughput). Similarly, *analytical standards* allow jurisdictions to make site-specific decisions about levels of infrastructure but provide specific requirements about the process for making those decisions. Table 2.2 provides a full list of the standard types considered, in order of increasing flexibility. The expert panel adopted, and the RAND team followed, the principle that standards would incorporate flexibility except where there is evidence to suggest a need for greater specificity and less flexibility.

Expert Panel and Preliminary Analysis Argued for Caution in Setting Quantitative Performance Thresholds

Given demands for accountability in the PAHPA legislation and elsewhere, we began the project with a provisional and rebuttable presumption that the standards would take the form of strict numerical performance thresholds such as “X PODs per 100,000 persons needing prophylaxis,” “X staff per POD,” and so on. However, discussions with subject-matter experts highlighted the extent to which planning decisions about each element of infrastructure (e.g., staffing, location) often depends on the other infrastructure elements. For instance, we learned that some communities start with the number of PODs and then determine required staffing, while others start with a given level of staff and then determine the number of PODs required. Thus, these discussions raised concerns about the wisdom of setting inflexible numerical thresholds for any one piece, given its potential impact on another element of POD infrastructure.

Table 2.2: Menu of Standards Types Considered

Type of Standard	Definition	Example
Strict numerical threshold	A single numerical target that must be met by all awardees	Each POD must have at least <i>X</i> staff per 8-hour shift.
Numerical range	A range of numerical targets into which all awardees must fall	At a minimum, each POD must have between <i>X and Y</i> staff per 8-hour shift.
“Green” versus “yellow” ranges	A range outside of which additional justification is required	Further justification is required if staffing levels lie in a “yellow zone” (e.g., more than <i>XX</i> staff per POD).
Consistency standards	Criteria that define the relationship among performance variables	Number of staff per POD must be consistent with expected throughput and the number of PODs.
Analytical standards	Requirement to conduct an auditable analysis or process to derive an appropriate target	The analysis used in developing staffing plans must include use of a staffing model.
Process standards	Requirements for the planning process (excluding analysis)	The process used in developing POD security plans must include consultation with law enforcement agencies.

Simple mathematical analysis confirms that several different configurations of POD infrastructure might plausibly lead to the same level of operational output. For instance, 10 PODs processing 500 persons per hour would likely produce the same level of operational output as 20 PODs processing 250 persons per hour. Thus, a standard that required a minimum of 20 PODs would foreclose other viable approaches to achieving the same result (assuming constant population).

The expert panel echoed this concern for the most part and emphasized that POD infrastructure standards should provide considerable flexibility. Further, most members of the panel cited the weakness of the empirical evidence base as an additional reason that a uniform approach is not appropriate or sensible at this time. There was, however, a clear minority position that argued for adopting clear numeric standards (the weakness of the evidence base notwithstanding) as a necessary step in moving toward stronger and more consistent performance across CRI sites.

RECOMMENDED STANDARDS PROVIDE FLEXIBILITY TO STATE AND LOCAL PLANNERS

Given these concerns, the recommended standards generally provide considerable flexibility to state and local CRI planners. The standards fall into four general categories.

- **Analytic standards:** Most of the proposed standards require some sort of auditable analysis as a basis for a site-specific POD planning decision. The defining characteristic of these standards is evident in terms such as *assess*, *estimate*, and *determine*. For instance, one proposed standard (1.1) requires that “The jurisdiction shall *estimate* the number of people who will come to PODs” as a basis for determining POD location.
- **Process standards:** Other proposed standards require that CRI sites engage in specific and auditable planning processes that do not necessarily involve analysis. Many involve requirements that jurisdictions consult with partners in making POD planning decisions. For instance, Standard 4.2 requires that “POD planners consult with those responsible for law enforcement on the security aspects of the POD plan.”
- **Consistency standards:** One proposed standard seeks to promote internal consistency via a quantitative algorithm about the relationship among elements of POD infrastructure. Standard (1.2) seeks to ensure that the number of PODs is compatible with per-POD throughput and with the total number of individuals needing to receive prophylaxis at PODs.
- **Specific requirements for POD plan:** A few of the proposed standards require that POD plans adhere to more specific requirements. For instance, Standard 3.1 lists a set of minimal functions that PODs must perform for those visiting them.

Additional detail on the motivation, evidence base, and logic behind each proposed standard is provided in the next four chapters.

3. RECOMMENDED STANDARDS ON THE NUMBER AND LOCATION OF PODS

OVERVIEW

This chapter presents standards that apply to the entire *set* of PODs to be located throughout a community.

First, the standards seek to ensure that the *number* of PODs in a community is sufficient to meet the CRI program goal of providing medications to the entire population within 48 hours of the decision to do so. This aggressive timeline will often require large numbers of PODs and it is essential that jurisdictions have clear guidance in identifying the minimum number needed. Second, the standards address the *location* of PODs. A motivation for location standards is to ensure that access to PODs is equitable – that all mobile members of the community can reasonably travel to a POD to receive medication and that no parts of the community are placed at a disadvantage.

To that end, we recommend the following standards on the number and location of PODs:

Standard 1.1: The jurisdiction shall estimate the number of people who will come to PODs to pick up medication, along with their geographic distribution.

Standard 1.2: The number of PODs shall be greater than or equal to the number of persons needing to receive prophylaxis at PODs divided by per-POD throughput multiplied by 24 hours (48 hours minus 12 hours for initial CDC delivery to warehouse and 12 hours to get materiel from warehouse to PODs) (DHS, 2007, p. 469).

Standard 1.3: All POD locations shall meet relevant SNS site guidelines and security criteria.

This chapter explains the overarching considerations for setting standards on the number and location of PODs and, for each of the standards shown above, explains the rationale for the standard; the process for meeting the standard; and the issues, questions, and options that were raised regarding the standard.

CONSIDERATIONS IN DEVELOPING RECOMMENDED STANDARDS

A key theme emerging from the analysis conducted prior to the convening of the expert panel is that selecting an optimal number of and locations for PODs depends strongly on community context. We describe the key findings from this analysis as well as other considerations noted by the panel.

Required Number of PODs Depends on per-POD Throughput

The chief concern in creating a network of PODs is whether the number of PODs is sufficient to administer prophylaxis to the entire population of the community within the necessary time frame. Whether the number of PODs is sufficient will depend upon the size of the population as well as the rate at which PODs can administer prophylaxis. The rate of administering prophylaxis is referred to as the *throughput* of the POD and is often expressed in terms of number of persons per hour. Thus, if 48,000 people have to

receive prophylaxis in 24 hours, this requirement could be met by a single POD processing 2,000 persons per hour or by four PODs each processing 500 persons per hour.

The mass prophylaxis plans from the 21 original pilot CRI sites illustrate that there are a variety of ways of ensuring that a sufficient number of PODs are available to carry out the mass prophylaxis mission. Some jurisdictions used a small number of larger PODs with higher throughput, reasoning that they would have difficulty staffing and managing a large number of PODs. For instance, one medium-sized jurisdiction reported using just 21 PODs, each with a planned throughput of approximately 1,000 persons per hour. Other jurisdictions used a large number of smaller PODs, each staffed with fewer workers, so that PODs could be located within walking distance of most of the population. For instance, another medium-sized jurisdiction reported using over 100 PODs, each with planned throughputs of just 300 persons per hour. Yet others used a combination of both larger and smaller PODs, with one jurisdiction reporting PODs capable of providing prophylaxis at a rate of 500 to 2,000 persons per hour.

Standard for Travel Distance Might Depend on Population Density

The mass prophylaxis plan should ensure that all the people in the jurisdiction, regardless of their demographic or location, have equitable access to PODs. While many factors affect access, for simplicity, we analyzed the *travel distance* to the nearest POD (via the road network) as a surrogate measure of accessibility and developed a model that would select POD locations based on travel distance. Details of this analysis are provided in Appendix C.

Achieving smaller average travel distances is easier for MSAs with smaller geographic areas and higher population densities. A densely populated area will require more PODs to serve its population compared to a sparsely populated area, assuming that PODs are similarly sized. Distributing more PODs over a smaller geographic area will result in smaller average travel distances for the population. Standards that call for an upper bound on required travel distances to ensure better accessibility would thus be easily achievable for small, densely populated MSAs but impossible to meet for large and less dense areas.

Trade-Off Between Minimizing Travel Distance and Same-Sized PODs

Population density will usually vary considerably within a given metropolitan area, especially between the urban core and outlying areas of a jurisdiction. Depending on the placement of PODs relative to the population, the actual number of individuals who come to each POD may vary widely from one POD to the next. In one example, PODs in densely populated areas in the MSA's core would have to handle 10 times as many clients per hour as those in the less dense areas. Jurisdictions would have to design and staff the higher-volume PODs accordingly. Alternatively, to even out the size of the populations going to each

POD, jurisdictions could set up more PODs in the denser areas, perhaps at the cost of having fewer PODs and longer travel distances in sparse areas.¹²

Either of these strategies, one emphasizing more equal travel distances to PODs or the other, emphasizing more even sizing of PODs, is potentially feasible. However, there is an inherent trade-off between the two goals: Mandating a standard that favors shorter travel distances would often force a jurisdiction into accepting different-sized PODs and vice versa. Instead of mandating one strategy, it may be more important to ensure that jurisdictions are aware of the geographic distribution of their population and the effect that this distribution would have on the placement and sizing of PODs in the mass prophylaxis plan. Details of this analysis are in Appendix C.

SYNTHESIS OF PANEL DISCUSSION

The panel discussion affirmed the complexity of POD location decisions, with panel members noting that the optimal number of PODs depends strongly on other planning factors (e.g., throughput) and on community context (e.g., population density, transportation infrastructure, availability of sites). Accordingly, the panel resisted the idea of strict standards for the number of PODs in a jurisdiction — including standards based on the number of PODs per capita. Panelists stressed the need to avoid standards without a clear or compelling evidence base that would unduly constrain flexibility and innovation among CRI sites.

The panel also stressed the importance of standards that allow for, and even encourage, measures to reduce the demand for traditional POD facilities. These measures include home delivery of prophylaxis via the USPS (currently under study in some jurisdictions); the use of so-called “closed” PODs (i.e., PODs designed to serve specific population groups located at nursing homes, businesses, or other similar locations); drive-through PODs or mobile outreach PODs for rural areas; and head-of-household dispensing (i.e., allowing a single individual to pick up medications for all of those living at a single residence).

The recommended standards related to the number and location of PODs reflects many of the issues and concerns raised by the panel. For instance, we did not include standards specifying a minimum or maximum number of PODs, a minimum or maximum size of PODs, or a maximum travel distance to the nearest POD. The recommended standards also provided a significant degree of flexibility in defining the population to be served by the system of PODs.

¹² Note that one of the rationales for seeking to equalize the size (required throughput) of different PODs, as suggested in the SNS guidelines, is that it makes it easier to develop a standard POD plan (e.g., required number of staff) that is simply replicated from one location to the next. Striving to minimize the variation in travel distances, on the other hand, may help to ensure that the POD plan is geographically equitable for different segments of the population.

STANDARD 1.1: DETERMINING DEMAND FOR PODS

The first standard requires that CRI sites provide a systematic analysis of likely demand for PODs. However, the standard requires analysis of not only the *total number* of likely POD visitors but also their *geographic distribution*.

Standard 1.1: The jurisdiction shall estimate the number of people who will come to PODs to pick up medication, along with their geographic distribution.

Explanation

To ensure that the number of PODs is sufficient to provide initial prophylaxis within 48 hours, it is first necessary to develop an accurate estimate of the size of the population to be served via PODs. Furthermore, when considering the placement of PODs and the throughput required at each, jurisdictions need to characterize the geographic distribution of the population so that variations in population density among regions within the jurisdiction can be taken into account.

The panel, along with reviewers, found it difficult to agree upon a specific definition of who should be included in the target population for every jurisdiction (e.g., residents, workers, visitors).¹³ Accordingly, the standard recommended here does not specify who should be included in the population that will be served by a POD. Based on guidance from the panel, the standard assumes that individual jurisdictions are in the best position to estimate the population for which they will be responsible when administering prophylaxis.¹⁴

¹³ One possibility suggested is to declare “residential” population as the minimal standard for defining POD demand. The reasoning was that in a large-scale anthrax attack, the jurisdiction may be in a state of emergency in which people are advised to stay home rather than go to school or work. Consequently, the population would require PODs near their residences.

However, panelists and reviewers suggested that considerable numbers of non-residents might need and seek prophylaxis in some jurisdictions and scenarios, especially areas where there are large numbers of workers, tourists, students, and others who might not ordinarily be considered local residents but would also require prophylaxis. In some areas, the daytime population may vastly outnumber the nighttime population, while in other areas the reverse may be true. Requiring one definition of population over another as a uniform standard, without taking into account the distinctive characteristics of each jurisdiction, therefore seemed unwise.

Another possibility suggested is to require jurisdictions to develop plans that include *more than one* definition of population in order to promote flexibility. We recommend that this option be considered in future rounds of standards development and revision. (See Chapter Seven for a discussion of evaluation, review, and revision of the standards over time).

¹⁴ Some jurisdictions may in fact choose to develop more than one mass prophylaxis plan to apply as needed when an actual emergency arises. This might be helpful, as noted, in cases in which an area’s

Suggested Documentation

Compliance with this standard would require documentation of the population characteristics shown in Tool 3.1 (note that several of the estimates are optional and may not be applicable to all jurisdictions). These estimates should be provided for smaller geographic units – such as census tracts or zip codes – and then summed for the service region as a whole. Estimates should be reviewed annually and updated whenever new data are available (e.g., from the U.S. Census Bureau or local metropolitan planning organizations).

As noted earlier, there are questions about who should be included in calculating the relevant population for the purposes of this standard. Thus, Tool 3.1 suggests that jurisdictions begin with residential population and then make upward and downward adjustments, as appropriate.¹⁵ For instance, the number of people requiring prophylaxis at PODs may have to be adjusted *upward* to take into account the daytime working population and tourists; depending on the jurisdiction or the specific area within the jurisdiction (consider, for example, downtown Manhattan), daytime worker and visitor populations may vastly exceed the nighttime residential population. Similarly, some jurisdictions might also expect to receive fleeing populations during an emergency.

Conversely, the number of people requiring prophylaxis at PODs may also be adjusted *downward* if “push” modalities — for example, USPS delivery to residences or direct delivery to institutions such as large companies, nursing homes, and treatment centers — are employed to reduce the pressure on PODs. Many, though not all, CRI sites also allow for “head-of-household” dispensing, through which one person is permitted to pick up medications for other members of his or her household. The recommended standard allows jurisdictions to decrease the number of people who are anticipated to come in person to PODs according to any of these considerations.

daytime population is significantly different from the nighttime population, or alternatively where an area’s population during the summer months is significantly different during winter. Given that not all jurisdictions face such considerations, however, the idea of developing alternate plans for different circumstances was not considered appropriate as a national standard.

¹⁵ Note that the estimate of “residential population” may need to include not just permanent local residents but also groups such as university students, patients in care facilities, and others who maintain some sort of regular presence in the jurisdiction but legally reside elsewhere.

Tool 3.1: Sample Spreadsheet for Population Estimates

Census Tract	1 Residential Population	2 Worker Population	3 Visitor Population	4 Adjusted Base Population	5 Population Served by Postal Delivery	6 Population Served by Other Push Strategies	7 Population Served by PODs	8 Population Expected to Visit PODs
Tract A								
Tract B								
etc.								
Tract X								
Tract Y								
etc.								
Total								

1. **Residential population:** At minimum, this represents the number of individuals who reside within each geographic unit of analysis. In addition, university students, persons living in patient care facilities, and others who maintain some sort of regular presence in the jurisdiction may need to be included.
2. **Worker population** (if applicable): This represents the number of employees who work in each geographic unit of analysis (the workers may reside elsewhere). It should be included if the jurisdiction plans to provide prophylaxis to people near their places of work.
3. **Visitor population** (if applicable): This represents the average number of tourists or other visitors who may be lodging within a geographic area on any given day. It should be included if significant numbers of out-of-town visitors might need to receive medication at PODs. It might be useful to provide estimates by season or time of year, as appropriate, given fluctuations in the tourist population.
4. **Adjusted base population:** This is the total number of people within each geographic unit of analysis who need to receive prophylaxis, taking into consideration residential (column 1), worker (column 2), and visitor (column 3) population estimates.
5. **Population served via postal delivery** (if applicable): If a jurisdiction will be using a postal plan to supplement PODs, this column should list the number of individuals in each geographic unit of analysis who will receive regimens via postal delivery and therefore will not need to receive medications at PODs during the first 48 hours.
6. **Population served by other push strategies** (if applicable): This represents the number of people in each geographic area who will receive regimens via other push strategies (for instance,

on-site delivery to large companies, military installations, prisons, or nursing homes or first responders given prophylaxis out of local caches) and therefore will not need to receive medications at PODs during the first 48 hours.

7. **Population served by PODs:** This represents the total expected number of people in each geographic unit of analysis who will receive their regimens from PODs. It is calculated by starting with the adjusted base population estimate (column 4) and then subtracting both the population to be served via postal delivery (column 5) and the population to be served via other push strategies (column 6).
8. **Population expected to visit PODs (if applicable):** This represents an estimate of the number of people from each geographic unit of analysis who will come to a POD location in person. If the jurisdiction plans to follow a head-of-household dispensing procedure, through which one individual can pick up multiple regimens for other members of the household, then this estimate should be substantially smaller than the number of individuals who will receive their regimens (directly or indirectly) from PODs. In this case, jurisdictions should develop an estimate of the average number of regimens to be picked up by each person who visits a POD (which might be related, for example, to the average household size in the region, a statistic that is available from U.S. Census Bureau data). This estimate can, in turn, be used to approximate the number of individuals likely to visit a POD in person.

Remaining Issues and Options Related to the Standard

A concern raised by CRI site representatives was that the sort of fine-grained population analysis required by Standard 1.1 would be beyond the skill and capacity of many jurisdictions. Indeed, analysis of population data at this level of detail is typically performed using geographic information system (GIS) software, and this requires a certain level of sophistication and technology. While some larger MSAs have this capability within their health departments and others have been able to partner with other government agencies (e.g., police, fire, emergency management, public works) within their jurisdictions, some jurisdictions may not have the necessary technical or human resources to conduct this analysis efficiently.

The RAND team judged that such analysis is a necessary and vital component of mass prophylaxis planning. However, given the burden that this analysis may impose on state and local health departments, decisionmakers may wish to consider delaying the adoption of this standard until software tools to enable this analysis are more readily available at lower cost¹⁶ and state and local health departments are trained in

¹⁶ HHS ASPR has contracted with RAND to develop a prototype of such a system.

these techniques. HHS and CDC may also need to strengthen their ability to provide technical assistance to jurisdictions to help them perform the analysis needed to meet this standard. Alternatively, CDC might seek to intensify efforts to promote integration between public health and city planning, public works, transportation, and other departments likely to possess GIS capabilities.

STANDARD 1.2: MATCHING POD SUPPLY TO DEMAND

Standard 1.2 requires jurisdictions to combine the population analysis developed pursuant to Standard 1.1 with estimates of hourly POD throughput in order to ensure that the *supply* of PODs matches demand.

Standard 1.2: The number of PODs shall be greater than or equal to the number of persons needing to receive prophylaxis at PODs divided by per-POD throughput multiplied by 24 hours (48 hours minus 12 hours for initial CDC delivery to warehouse and 12 hours to get materiel from warehouse to PODs) (DHS, 2007, p. 469).

Explanation

As noted previously, the panel was concerned that a uniform standard on the number of PODs required would stifle innovation by local jurisdictions. Thus, rather than being a simple numeric standard, this standard requires *consistency* among four key elements of POD plans:

- **number** of PODs in the mass prophylaxis plan
- **throughput** levels at the PODs, typically measured in terms of the number of persons per hour that the POD can serve
- **population** who will visit PODs in person to receive prophylaxis, as determined in Standard 1.1¹⁷
- **time frame** in which the prophylaxis campaign is to be carried out, based on the CRI goal of providing prophylaxis to the entire population within 48 hours of the decision to do so.¹⁸

¹⁷ Note, again, that jurisdictions have little control over the size of their population, but they can reduce the number of people who will come to PODs by (1) allowing persons to pick up medications for others or (2) directly delivering (“pushing”) medications to homes, businesses, or other segments of the population.

Specifically, the following relationship among these four factors must hold:¹⁹

$$\text{Number of PODs} \geq \frac{\text{Population visiting PODs in person}}{\text{Hourly per - POD throughput} \times 24 \text{ hours}}.$$

Thus, there are a variety of ways in which a jurisdiction's mass prophylaxis plan can meet the requirement of administering medications to its population. Meeting a specific numerical standard on each of the three factors — number, throughput, and population — is not necessary. Rather, what is crucial is that the decisions regarding number, throughput, and population all combine to produce an internally consistent plan, as expressed by the formula just shown.

Graphically, this means that for a given population, the number and per-POD throughput must fall along a curve relating the two factors. Figure 3.1 shows the curve for an MSA with a population of about 780,000 (roughly the size of San Francisco). The population could be served in a 24-hour time frame by 150 PODs, each with a per-POD throughput of 200 persons per hour. Alternatively, the same population could be served in the same time frame by 50 PODs with a per-POD throughput of 600 per hour.

The formula and figure presume that each POD has essentially the same design and staffing, will serve approximately the same number of clients, and will therefore produce roughly the same level of throughput. Some jurisdictions plan on employing PODs of different sizes. In some cases, larger PODs may simply be treated as multiples of small PODs; for example, a baseline small POD may have a throughput of 500 persons per hour, and thus a large, 2,000-person-per-hour POD may be considered equivalent to four small PODs.

In cases in which planned POD throughputs vary considerably and this simplification will not work, the jurisdiction should document this condition. A slightly more complicated form of the formula, taking into account PODs of varying sizes and throughputs, would add up the throughputs at each POD and make sure that total throughput is sufficient to administer prophylaxis to the entire population in 24 hours:

$$\sum_i \text{Hourly throughput at POD}_i \times 24 \geq \text{Population visiting PODs}$$

¹⁸ Note, however, that up to 12 hours will be needed for the initial shipment of materiel from CDC to the state warehouse (CDC, 2006), and up to 12 additional hours will be needed to move materiel from the state warehouse to PODs (DHS, 2007, p. 469). During that transport time, the jurisdiction will have to simultaneously prepare PODs for operation. This leaves just 24 hours for dispensing medications.

¹⁹ The formula is taken from CDC (2006).

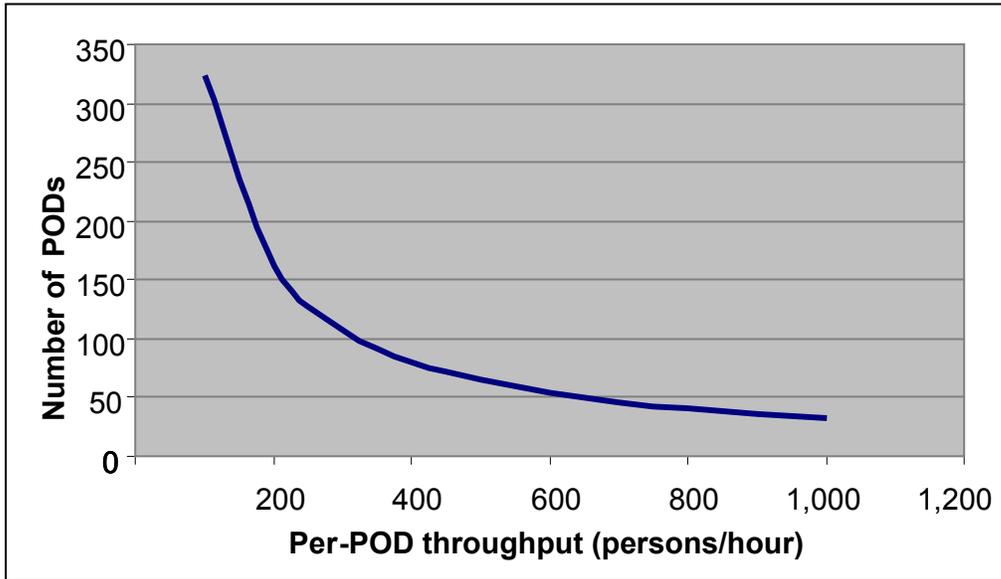


Figure 3.1: Relationship Between per-POD Throughput and Number of PODs Needed to Serve a Population of 780,000 in 24 hours

Suggested Documentation

Compliance with this standard would require the following documentation:

1. **Total number of PODs:** The jurisdiction shall specify the number of planned POD locations according to the mass prophylaxis plan.
2. **Throughput calculation:** The jurisdiction’s mass prophylaxis plan shall demonstrate that the system of PODs satisfies the mathematical relationship shown earlier:²⁰

$$\text{Number of PODs} \geq \frac{\text{Population visiting PODs in person}}{\text{Hourly per - POD throughput} \times 24 \text{ hours}}$$

Note that within this formula, the “greater than or equal to” relationship indicates that the jurisdiction must provide at least the minimum number of PODs necessary to serve the intended population in accordance with the CRI program goal of 48 hours from the decision to do so. Jurisdictions may want to include additional PODs in order to provide excess, or “buffer,” capacity.

A jurisdiction that can document a shorter time for the RSS and distribution functions should be permitted a longer amount of time for dispensing within the 48-hour CRI goal.

²⁰ For brevity, the simpler version of the formula is shown here. The more complicated form previously described may also be used as appropriate.

Remaining Issues and Options Related to the Standard

A common issue raised during the review of the draft standards by CRI sites involves the time frame that should be included in the denominator of the formula. Specifically, what time frame should be assumed for mass prophylaxis operations within the system of PODs? As noted earlier, the recommended standard assumes that it will take up to 12 of the full 48 hours for CDC to deliver materiel to the state RSS (according to the SNS program guidance) and that it will take up to 12 additional hours to move the materiel from the RSS facility to the PODs (as required by the TCL). The standard was thus drafted with a worst-case scenario in mind (note that the argument is that the CDC-to-RSS and RSS-to-POD steps could take “up to” 12 hours each). However, several reviewers suggested that jurisdictions could often begin distributing materiel out of local caches before arrival of the SNS materiel.

Some CRI site representatives also suggested that — the amount of time in the denominator notwithstanding — the number of PODs required by such a formula would be unrealistically high in the sense that it would be extremely difficult for jurisdictions’ staff to operate the number of PODs called for. Members of the expert panel, however, generally believed that the formula is an accurate representation of what is required to address the aerosolized anthrax scenario envisioned by the CRI program. Consequently, jurisdictions would have to find a way to provide the number of PODs required to serve the population according to the formula, either by increasing the number of PODs; reducing the population to be served by PODs by using head-of household dispensing, push modalities, or other delivery methods; or increasing throughput by streamlining POD operations.

STANDARD 1.3: MINIMAL REQUIREMENTS FOR POD SITES

Another frequently mentioned theme in the expert panel discussions about POD location was the importance of ensuring that POD sites meet minimal facility and infrastructure requirements. Accordingly, Standard 1.3 specifies that planned POD locations shall meet the basic site and infrastructure requirements in the SNS program guidance.

Standard 1.3: All POD locations shall meet relevant SNS site guidelines and security criteria.

Explanation

Seeking to avoid unnecessary duplication, we recommended that CRI program standards reference the facility requirements written into the SNS program guidance (currently version 10.02; see CDC, 2007b).

Suggested Documentation

Compliance with this standard would require the following documentation:

1. **List of all POD locations:** The jurisdiction shall provide a list of all POD locations (ideally including Global Positioning System [GPS] coordinates). This should include both primary PODs and backup POD sites. The listing for each location should include a name or description of the site (e.g., King High School), as well as a physical address (including street address, city, state, and zip code). If the site does not have a street address, a suitable alternative geographic reference (e.g., nearest intersection, latitude and longitude) should be specified.
2. **Certification that all sites meet appropriate physical characteristics:** The jurisdiction shall provide certification, in the form of a signature from a duly authorized representative of the lead agency for mass prophylaxis, that all POD sites included on the list meet the physical requirements — such as accessibility, electricity, sufficient parking, sufficient floor space, climate control, and available restroom facilities — suggested by the SNS program guidance (CDC, 2007b, Chapter 12).
3. **Certification that all sites meet appropriate security guidelines:** On a regular basis the jurisdiction shall provide certification, in the form of a signature from a duly authorized representative of the agency that will oversee security operations, that all POD sites meet the minimum security standards — such as the ability to secure and guard medications and the ability to control POD entry and exit points (both are suggested in the SNS program guidance [CDC, 2007b, Chapter 12], and the TAR tool; see also Standards 4.1, 4.2, and 4.3 herein on security.)

Remaining Issues and Options Related to the Standard

Standard 1.3 raised few issues during review by the expert panel and representatives of CRI sites. One minor issue was whether it would be better to list the facility criteria in the standards rather than referring to another document. We chose the latter strategy in order to minimize the need to update the standards when views on facility criteria change. This strategy also ensures alignment of the standards with the SNS program guidance.

Another concern expressed by some (but far from all) CRI site representatives reviewing the standards was that site facility criteria should differ for urban versus rural PODs. For instance, a few reviewers noted that while parking space is critical for most PODs, it is much less important for walk-up PODs in dense urban areas. We recommend that CDC DSNS consider exercising some flexibility in enforcing this standard but concluded that drafting criteria for different types of PODs would add too much complexity to the standards without sufficient benefit.

ADDITIONAL LOCATION STANDARDS CONSIDERED BUT ULTIMATELY NOT RECOMMENDED

We asked the expert panel to consider additional standards that related to the ability of the population to access PODs. The standards could address issues such as the travel distance to reach a POD and the proximity of POD locations to transit stations. Both of these were opposed by the panel and/or by CRI site representatives and ultimately were not included in the recommendations.

Distance Standard Rejected

We proposed for consideration a travel distance standard that would apply only in the most densely populated areas of a given MSA.

Based on our location analysis, we determined that uniform travel distance standards could not be evenly applied to all jurisdictions across the country. Travel distances are heavily dependent on characteristics such as geographic size and population density, and these vary considerably from one CRI site to the next (see Appendix C).

We did suggest that it might be possible to develop travel distance standards that would be keyed to population density. In other words, denser CRI sites would be required to ensure shorter travel distances than would CRI sites with lower population densities. The idea behind the draft standard was to require short travel distances in densely populated urban areas (e.g., where population density exceeds 10,000 persons per square mile) but not in other areas. This would enable many residents to walk to PODs if the roads were blocked or if the public transportation system was disabled. Specifically, the draft standard would have required that

In densely populated sub-regions within a jurisdiction, where population exceeds 10,000 persons per square mile, PODs shall be located within a distance of two miles.

Expert panel members, however, did not view this idea favorably. To begin with, the expert panel strongly resisted the notion that access could be equated to travel distance. Several panelists pointed out that the key issue is travel *time* rather than travel *distance*. For instance, while having to travel 10 miles to a POD might be considered too far in a dense urban area, it might be perfectly acceptable in a sparsely populated periphery of a metropolitan area with good roads and free-flowing travel conditions. This suggests that standards based on distance would be unnecessarily complex, overly prescriptive, and insensitive to site-specific characteristics of the transportation system. It was also noted that most CRI planners lack access to sophisticated location optimization tools, and this would make it even more difficult for CRI sites to achieve and demonstrate compliance with standards on travel distance.

Many reviewers expressed concern about a standard that would *require* that individuals walk to PODs in dense urban areas.²¹ Others argued strongly that the standard was too detailed and prescriptive, that the definition of two miles as being walkable was arbitrary,²² and that state and local officials should retain more discretion over these decisions. Thus, the walking distance standard was dropped from further consideration.

Transit Standard Rejected

In our discussions with the expert panel, we also suggested the idea of developing a standard related to the accessibility of PODs via public transit. Such a standard might state, for example, that 10 percent of the POD locations must be located within a quarter mile of one or more transit stations. The general intent of such a standard would be to ensure that transit-dependent individuals would be able to access the POD system.

This suggestion also met with little approval. To begin with, the size and scope of transit services vary considerably from one region to the next. As a result, it might be very easy for one CRI site to meet such a standard but impossible for another. Moreover, it was noted that in MSAs where transit makes up a significant share of transportation, planners have already taken steps to ensure that POD locations are accessible via the transit system. For this reason, we did not include a standard related to transit accessibility in our set of recommendations.

SUMMARY AND CONCLUSIONS

This chapter described standards for the number and location of PODs. Following guidance from the expert panel described in Chapter Two and the analysis presented here, standards on the number of PODs are designed to promote a degree of flexibility in terms of how jurisdictions can meet the overall CRI program goal of being able to administer prophylaxis to their entire populations within 48 hours of the decision to do so. Thus, Standard 1.1 (number of PODs) requires a careful and detailed analysis of the number and location of individuals in the community who are likely to seek prophylaxis at PODs. Adherence to this standard would help ensure that planning for the number and location of PODs is based on a clear picture of likely demand. Standard 1.2 (number of PODs) declines to identify a specific number of PODs per community or PODs per capita in favor of a flexible and simple mathematical formula designed to ensure that POD supply is matched with likely demand for PODs.

²¹ The original intent behind the recommended standard was only to ensure that walking remained a viable option.

²² The choice of two miles for the standard was based on a finding from Enright and Sherrill (1998) that healthy men and women walk approximately three miles per hour. Thus, absent traffic congestion and other impediments, individuals should be able to walk two miles in less than 40 minutes.

The standards leave considerable discretion to state and local decisionmakers about where PODs should be located, requiring only that those sites identified as potential PODs meet minimal infrastructure criteria. Instead of defining new criteria, Standard 1.3 (POD location) simply references those in the SNS program guidance (CDC, 2007b).

4. RECOMMENDED STANDARDS FOR INTERNAL POD OPERATIONS

OVERVIEW

In routine circumstances, such as annual influenza vaccination clinics, PODs might include a fairly broad range of functions, including thorough client education and detailed screening for contraindications. In such circumstances, PODs prioritize accuracy over speed. In contrast, during a large-scale anthrax attack or similar scenario, PODs will have to provide a large number of people with prophylaxis in a short amount of time, often using as few POD staff as possible. The requirements of a large-scale emergency, especially the need to serve a large number of clients, may necessitate reducing the amount of time spent with each client and reducing staff requirements for formal medical training. This has the result of placing a higher priority on speed at the cost of a lower priority on accuracy. Standards for internal POD operations specify the minimum set of functions or steps that a POD must carry out during such circumstances.

To that end, we recommend the following standards on POD operations:

Standard 2.1: Jurisdictions shall have at least one viable and exercised rapid-dispensing²³ protocol. For the purposes of this standard, a rapid-dispensing protocol is one in which the following functions are provided by means that minimize the need for medically licensed personnel at the POD sites:

- **directing clients through the POD**
- **deciding which medication to dispense**
- **disseminating information about the medication**
- **dispensing the medication.**

Such means might include, but are not limited to, information campaigns to educate the public before arrival at the POD, signage and automated messages at the POD, and standing protocols so that non-medically licensed personnel can perform POD functions.

Standard 2.2: Jurisdictions shall ensure that legal and liability barriers to rapid dispensing are identified, assessed, prioritized, and communicated to those with the authority to address such issues. Such issues include standards of care, licensing, documentation of care, civil liability for volunteers, compensation for health department staff, rules governing the switch between dispensing protocols, and appropriation of property needed for dispensing medications.

Standard 2.3: Jurisdictions shall have viable and exercised procedures for selecting an appropriate dispensing protocol (e.g., medical model versus rapid dispensing).

²³ *Rapid dispensing POD* is the term used in the CDC DSNS TAR tool.

This chapter first explains the overarching considerations used in developing the standards, then discusses each standard individually, and, finally, describes other suggestions from panel members.

CONSIDERATIONS INFORMING DEVELOPMENT OF RECOMMENDED STANDARDS

We began by collecting information from 21 CRI sites to get a sense of current practice, determine what sorts of standards might be feasible, and see whether standards might be built around a de facto consensus in current practice. Each site was given a standard list of POD steps,²⁴ asked whether its POD design(s) included the steps, and, if so, asked to specify the level of training required for staff executing each step. Figure 4.1 summarizes data from the 18 of the 21 original CRI pilot sites providing data.²⁵ The list of steps included greeting, form distribution, triage, medical evaluation, mental health evaluation, briefing, drug triage, dispensing (oral and vaccination), and form collection and exit.

While all sites reported having a dispensing step, the remaining steps were not used by all sites. The briefing step appears to be the most commonly omitted, with six of the 19 sites omitting this step. Entry greeting and triage, form distribution, interview screening, and a formal exit step were common, though not universal, among the 19 POD designs. (See Figure 4.1.)

There was similar variation in the minimum level of training required for each step.²⁶ Medical training was most commonly required for entry triage, interview/screening, and dispensing, though several sites reported that these steps are executed by nonmedical staff. In contrast, no sites reported requiring medical training for the exit step, and only two sites reported requiring it for form distribution.

In short, there appears to be little consensus in practice with regard to particular approaches to internal POD operations.

²⁴ The list of steps was adapted from Hupert et al.(2004). See Appendix A for the survey instrument used to gather the data.

²⁵ One site provided data on two POD designs, one more streamlined than the other. Thus, we had a total of 19 POD designs.

²⁶ In the figure, “Nurse/MD” means that the site reported that the step could be performed by either a registered nurse or a medical doctor. “Nurse/pharma” means that the site reported that the step could be performed by either a registered nurse or a pharmacist. “Allied health” denotes allied health professionals, including EMTs, licensed practical nurses, or other health professionals.

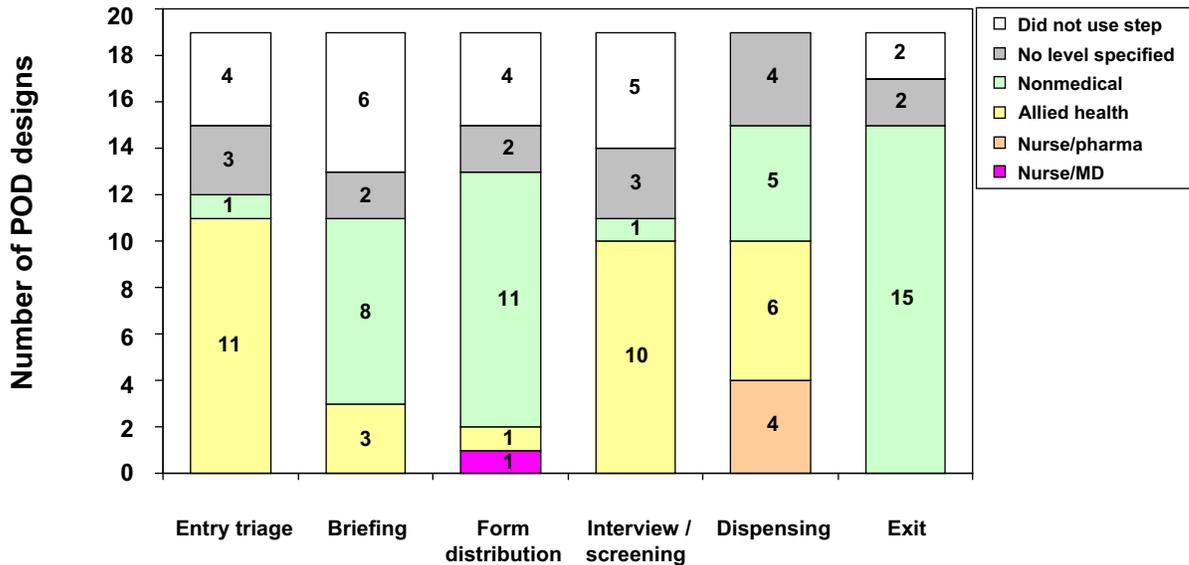


Figure 4.1: POD Steps Used by CRI Awardees

STANDARD 2.1: DEFINING MINIMAL ELEMENTS OF POD DESIGN

A common theme in panel discussions was that POD protocols must be appropriate to the specific circumstances at hand. Accordingly, less elaborate dispensing protocols are not only appropriate but are required in situations necessitating full-community prophylaxis in a short time period. The panel also judged that, given the likelihood of staff shortages, persons without formal medical training or licensure could be used to perform most POD functions, including most client interview/screening and dispensing. However, members suggested that in such cases, nonmedical personnel should be supervised by medically trained and/or licensed personnel.

Panelists noted that many important POD functions can happen outside of the formal POD boundaries. For instance, information campaigns could be used to instruct the public, such as directing persons who are experiencing symptoms to go directly to treatment centers or raising awareness of the most important contraindications for antibiotics (e.g., pregnancy, allergies), thus reducing the need for on-site screening and triage at the POD sites. Similarly, several panelists pointed out that effective pre-POD communication about POD flow and procedures could help increase throughput and reduce the need for security (see, e.g., CDC, 2005).

Thus, the first standard on POD operations requires jurisdictions to develop and exercise at least one POD protocol in which many traditional POD functions are performed by non-medically licensed personnel or outside the POD entirely to reduce the number of staff required at the POD and increase POD throughput.

Standard 2.1: Jurisdictions shall have at least one viable and exercised rapid-dispensing protocol.

For the purposes of this standard, a rapid-dispensing protocol is one in which the following functions are provided by means that minimize the need for medically licensed personnel at the POD sites:

- **directing clients through the POD**
- **deciding which medication to dispense**
- **disseminating information about the medication**
- **dispensing the medication.**

Such means might include, but are not limited to, information campaigns to educate the public before arrival at the POD, signage and automated messages at the POD, and standing protocols so that non-medically licensed personnel can perform POD functions.

Explanation

The functions are defined as follows:

- **Directing clients through the POD.** PODs must maintain adequate levels of throughput by ensuring that movement into, through, and out of the POD is rapid, smooth, and orderly. Thus, POD protocols should include measures that clearly communicate to clients when to go to a POD (versus going straight to a medical treatment facility), where to go within the POD,²⁷ and what to expect.²⁸ The standard allows jurisdictions to determine how best to provide this information. Under more routine conditions, POD designs assign staff to perform “triage for symptoms” (from the TCL), during which individuals are screened just prior to entering the POD so that symptomatic individuals can be directed to treatment facilities (DHS, 2007, p. 483). Given likely throughput demands and the likelihood of staff shortages, however, the recommended standard requires jurisdictions to have at least one POD protocol to provide much of this information as possible is provided by means of signs, call banks, recordings, and public information campaigns (CDC, 2005).
- **Deciding which medication is appropriate.** A decision must be made about which medication each client will receive. In the TCL, this is part of a step called “medical

²⁷ The issue of which POD to visit is part of public information and communication efforts and therefore falls outside the purview of POD infrastructure standards.

²⁸ For some POD designs, this will involve direction to an “express” or “special needs” line. However, the standard does not require that PODs use express versus special needs lines.

screening,” which is often conducted by licensed medical professionals, who review client screening documentation and available medical history to determine the proper course of treatment (DHS, 2007, p. 484). Given the likely throughput requirements and staffing constraints, the recommended standard requires jurisdictions to have one protocol in which drug decisions are made, to the extent possible, according to standard decisions reflected in protocols. This allows for these decisions to be made by individuals without formal medical training or licensing. Protocols must be approved by officials from the state medical licensing board or other relevant authority and must be consistent with state emergency medical practice laws, regulations, and other requirements (see Standard 2.2).

- **Disseminating information about medications.** Each person who receives medication must also be provided with information about how to take the drug and what to do and where to go if an adverse reaction is experienced.²⁹ Under more routine conditions, POD designs often include a group briefing given to clients by POD staff. Given likely throughput demands and the likelihood of staff shortages, however, the recommended standard requires jurisdictions to have at least one POD protocol to provide as much of this information as possible by modes such as signs, recordings, handouts, and public information campaigns (see CDC, 2005). POD plans should consider the language and reading skills of the population. POD materials should offer options (e.g., multiple languages, use of pictures) to address these needs.
- **Dispensing the medication.** Medication must be handed to clients. Under more routine conditions, dispensing of medication is done by a licensed pharmacist or medical professional. Given the likely throughput requirements and staffing constraints, the recommended standard requires jurisdictions to have one protocol by which dispensing of medication is done, to the extent possible, by non-licensed persons. Provisions for dispensing medication (including staffing and whether/how much client information is collected) must be consistent with state emergency medical laws (see Standard 2.2).

In our discussion with expert panelists about the need for this standard, panelists emphasized the uniqueness of the 48-hour CRI scenario. As one panelist put it, “CRI is a different animal,” alluding to the fact that a CRI scenario is on a far larger scale than most other public health emergencies. Several panelists noted that the need to streamline PODs would be especially acute in the aftermath of a covert bioterrorist

²⁹ The monitoring of adverse effects is one of the capabilities outlined in the TCL (DHS, 2007, p. 485).

attack, during which awareness of the attack might come well into the 48-hour window for effective prophylaxis.

Several panelists also pointed to the postal option (at-home delivery via the USPS) that is currently being considered as justification for a minimal POD design. If this option were to be used, all screening and triage would occur through public information campaigns (e.g., media messages, fliers distributed with the medication). Some noted that there would be fairness concerns if the federal government insists on a higher standard of care for citizens visiting PODs than for those receiving medication via the postal method.

An earlier version of the standard stated that jurisdictions must have at least one streamlined POD model to perform the four minimal functions described here (directing, deciding, dispensing, and disseminating) and also encouraged jurisdictions to consider ways to provide at least some of these functions outside the POD. Feedback from several state and local health departments and from HHS suggested that this wording did not call enough attention to the imperative to develop streamlined POD models. Thus, we revised the standard to state more clearly the need for at least one streamlined POD protocol.³⁰

Suggested Documentation

Jurisdictions would be asked to provide

- copies of relevant plans and materials
- training materials and schedules
- after-action reports demonstrating that they have exercised the POD design
- corrective-action plans documenting process improvements made in response to exercises.

Tool 4.1 provides ideas about specific documents that could be used to demonstrate compliance with each of the functions listed here.³¹

Remaining Issues and Options Related to the Standard

A small number of reviewers called for a more specific and prescriptive standard (e.g., specific templates for field operations guides, job action sheets, and so on). We considered doing so and began by

³⁰ The earlier version of the standard read,

Jurisdictions shall have at least one viable and exercised rapid-dispensing protocol that addresses the following minimal functions: (1) directing clients through the POD, (2) deciding which medication to dispense, (3) dispensing medication, and (4) disseminating information about the medication. Note that this standard does not mandate that these functions be provided by medically licensed personnel and does not mandate that all of these functions be provided in person or on-site at the POD.

³¹ We sought to ensure that the list of items is consistent with the SNS program's local TAR Tool.

reviewing field operations guides and job action sheets identified by CDC DSNS as exemplary. However, the review did not reveal any practices that appeared strong or consistent enough to provide a sound foundation, and the effort that would have been required to develop standards from scratch was beyond the scope and budget of this project. Standards for field operations guides and job action sheets might merit attention in future standards development efforts.

Tool 4.1: Documentation for Standard 2.1

Directing	<ul style="list-style-type: none">▪ Copies of relevant signage from PODs▪ Public messages▪ Floor plans for PODs▪ Protocols for dealing with ill or upset clients, those refusing medication, those with contraindications, unaccompanied minors, and non-English speakers▪ Job action sheets▪ Training materials▪ Training logs
Deciding	<ul style="list-style-type: none">▪ Protocols for guiding decisions about which medications to dispense▪ Protocols/guidance on number of regimens that may be dispensed to each client▪ Job action sheets▪ Training materials▪ Training logs
Disseminating	<ul style="list-style-type: none">▪ Copies of relevant signage from PODs▪ Public messages (e.g., handouts), including drug and reaction information
Dispensing	<ul style="list-style-type: none">▪ Job action sheets▪ Training materials▪ Training logs

STANDARD 2.2: ADDRESSING LEGAL AND LIABILITY BARRIERS TO RAPID DISPENSING

As noted previously, a common theme in expert panel discussions about internal POD operations was that the steps required to provide medication to an entire metropolitan area within 48 hours might conflict with routine legal strictures. For instance, achieving required throughputs might require that jurisdictions relax client screening and/or recordkeeping requirements. Similarly, adequately staffing PODs might require the use of non-medically trained personnel for tasks usually restricted to licensed professionals. Thus, this standard requires that jurisdictions work with relevant state and local authorities to ensure that they have the legal authority to operate rapid-dispensing PODs (i.e., POD designs that are consistent with the minimal tasks outlined in Standard 4.1) during a public health emergency.

Standard 2.2: Jurisdictions shall ensure that legal and liability barriers to rapid dispensing are identified, assessed, prioritized, and communicated to those with the authority to address such issues. Such issues include standards of care, licensing, documentation of care, civil liability for volunteers, compensation for health department staff, rules governing the switch between dispensing protocols, and appropriation of property needed for dispensing medications.

Explanation

In discussing the need for this standard, some panelists pointed to the Swine Flu event (Mello and Brennan, 2005; Neustadt and Fineberg, 1983) and other historical examples as evidence that “eventually people will sue each other” over adverse reactions to medication, workers compensation claims, and other conflicts. This identifies to the need to develop a prior consensus about how decisionmakers will make trade-offs between speed and accuracy while engaging in rapid dispensing. Several panelists pointed to the Model State Health Emergency Powers Act (MSHEP) as a useful tool in standardizing legal frameworks across the nation (Center for Law and the Public’s Health, 2001; Gostin et al., 2002). However, panelists believed that a standard on legal frameworks was also required.

Suggested Documentation

Jurisdictions would be asked to provide citations to relevant sections of law or other policy documents that address the items in Tool 4.2.³² This should be accompanied by a discussion of how each jurisdiction addresses the relevant checklist item. *All* of the items in the checklist must be addressed.

To the extent possible, these efforts should build on existing laws, regulations, and other provisions. Multiple avenues may exist for addressing each item in the tool, including (but not limited to)

- volunteer protection statutes (Hodge, Pepe, and Henning, 2007)
- sovereign immunity doctrine
- good-samaritan statutes
- emergency response laws
- mutual aid laws
- memoranda of understanding (Hodge, Pepe, and Henning, 2007).

³² Note that the items in Tool 4.2 include the legal elements in CDC DSNS’s state TAR tool. Also see the discussion in ARHQ (2005) and Hodge, Pepe, and Henning (2007).

Note that each of the issues raised here is relevant to public health emergency preparedness generally — not just to POD planning — and that efforts to address them should be part of a holistic approach to modernizing public health and other emergency preparedness laws.

Remaining Issues and Options Related to the Standard

A large number of reviewers from CRI sites expressed concern that the standard holds health departments responsible for legal frameworks and provisions that lie beyond their direct control. We emphasize, however, that the standard does not require CRI sites or other health departments to change laws — only to identify, assess, prioritize, and communicate such issues to those who do have the authority to change them.

Several reviewers also pointed out that this standard makes much less sense for local health jurisdictions than for state jurisdictions, which typically have more direct contact with legislators and others with the authority to change legal/liability provisions. However, it seems likely that local health departments will be in a position to identify legal constraints and should be included within the standard’s reach.

Tool 4.2: Checklist of Legal Issues Related to POD Operations

✓	Standard of care can be temporarily relaxed if necessary to reduce total processing time and increase POD throughput
✓	Documentation of care standards can be temporarily relaxed to increase POD throughput
✓	Licensing requirements can be temporarily waived to allow non-medically trained personnel to carry out essential POD functions
✓	Scope of practice requirements can be temporarily relaxed in order to provide more flexibility in the use of available medically trained personnel
✓	Labeling requirements can be temporarily relaxed or waived in support of efforts to reduce processing times
✓	Liability can be temporarily waived or reassigned to reduce barriers to the use of volunteer staff and organizational entities working under the direction of and in coordination with health officials
✓	Workers’ compensation requirements can be changed temporarily to reduce barriers to the full and effective use of medical and nonmedical government staff and volunteers
✓	Property and facilities can be appropriated where needed to support dispensing operations

✓	Health authorities can compel treatment, isolation, and quarantine of individuals when necessary to protect public health ³³
✓	Laws are clear about who has the authority to waive requirements, under what conditions, and for what period of time
✓	Responsible officials can temporarily waive other laws, regulations, and requirements that might create barriers to mass prophylaxis operations

STANDARD 2.3: THE NEED FOR FLEXIBLE AND SCALABLE POD DESIGNS

Given that, for most jurisdictions, streamlined prophylaxis operations are a departure from standard practice, the panel discussed the need for a standard that ensures that jurisdictions have clear protocols for moving to and from streamlined prophylaxis operations. Thus, Standard 3.3 requires such protocols.

Standard 2.3: Jurisdictions shall have viable and exercised procedures for selecting an appropriate dispensing protocol (e.g., medical model versus rapid dispensing).

Explanation

PODs designed to respond to a CRI-like scenario are part of a broader spectrum of POD designs and protocols. While the need to provide prophylaxis to an entire metropolitan area within 48 hours argues for streamlined, rapid-dispensing modalities, changing circumstances might require more time, skill, and attention to be applied to each client. For instance, as jurisdictions move out of the initial 48-hour period, further epidemiological investigation might suggest follow-up prophylaxis of only a limited portion of the population. This and other changes in the situation might necessitate a different balance between dispensing speed and screening accuracy. Thus, mass prophylaxis plans must include a clear statement of triggers or conditions under which rapid dispensing should be activated.

An earlier draft of the standard emphasized the need for clear procedures for *switching* between POD protocols. Several reviewers pointed out that switching among POD protocols might conflict with existing legal frameworks. Other reviewers expressed concerns about the logistical feasibility of changing dispensing modalities during a mass prophylaxis operation. To address this concern, we rewrote the standard to emphasize *selection* of an appropriate POD protocol and to place less emphasis on switching

³³ Readers should note, however, that there is considerable controversy about this point. See, e.g., Annas, Parmet, and Mariner (2008).

between protocols. We also added selection of and switching between dispensing models to the list of legal/liability concerns addressed in Standard 2.3.

We also emphasize that the standard does not *require* switching — only that sites be *prepared* to do so. Moreover, to the extent that switching is necessary, it would likely come in the transition from “first-strike” prophylaxis during the first 48 hours to dispensing the remainder of the 60-day antibiotic regimen and would therefore take place over an extended period of time.

We also received feedback that that this standard’s focus on both streamlined and non-streamlined dispensing modes might dilute CRI’s emphasis on the need to be ready for the 48-hour scenario. The decision about whether to accept this recommended standard, therefore, might involve approaches to change management — something that was beyond the scope of the evidence and frameworks employed in the standards development process.

Suggested Documentation

Jurisdictions would be asked to provide

- a copy of relevant sections of mass prophylaxis plans, including references to relevant laws and authorities who must be consulted in selecting a protocol
- an after-action report that demonstrates that the triggering procedures have been used in an exercise or a real event.

ADDITIONAL SUGGESTIONS FROM PANEL MEMBERS

One panelist argued forcefully that standards on POD operations should emphasize the need to ensure that POD plans remain well integrated with federal, state, and local emergency management, hospital, and other disaster response plans. Such a standard could be considered a generalization of Standard 4.2, which requires consultation or approval of the POD plan by the relevant security authorities (see Chapter Six).

While no arguments were offered against the idea (either by panelists or reviewers at CRI sites), the idea was not championed by other members of the panel. We suggest that future standards development activities consider such a standard.

SUMMARY AND CONCLUSIONS

This chapter described recommended standards for internal POD operations. Standard 2.1 specifies the minimal critical functions required for PODs operating during large-scale public health emergencies, including (1) directing clients through the POD, (2) deciding which medication to dispense, (3) dispensing medication, and (4) disseminating information about the medication. The standard provides CRI sites with considerable flexibility in determining how to execute these functions and requires neither that the

functions occur on-site (with the exception of dispensing) nor that that functions be performed by medically licensed personnel.

In addition, Standard 2.2 seeks to ensure that POD workers possess the legal authority to run rapid-dispensing operations. Specifically, CRI sites would be required to identify, assess, prioritize, and communicate the legal/liability barriers to rapid dispensing to those with the authority to change such laws and legal frameworks. Finally, Standard 2.3 seeks to ensure that CRI sites have clear procedures for determining which POD protocols are appropriate for a given emergency event.

5. RECOMMENDED STANDARDS FOR POD STAFFING

OVERVIEW

Perhaps the most difficult aspect of conducting a mass prophylaxis operation in the CRI scenario is having sufficient staff³⁴ to operate the PODs. Jurisdictions must determine the number of staff needed to operate each POD at the level required to handle the number of people who will come to it seeking prophylaxis. Further, jurisdictions need to recruit staff in sufficient numbers and maintain the ability to contact them so that they can be quickly mobilized in the event of an emergency.

To that end, we recommend the following standards on the staffing of PODs. (In the case of Standards 3.3 and 3.4, the panel was unable to come to consensus on the stringency of the standard, and as a consequence, we have presented two alternatives for consideration by decisionmakers.)

Standard 3.1: Jurisdictions shall estimate the number of individuals who are likely to visit each POD location and determine the required hourly throughput at each POD.

Standard 3.2: Jurisdictions shall determine and verify the number of staff required to administer prophylaxis to the population (identified pursuant to Standard 1.1) by conducting drills with time studies.

Standard 3.3, Alternative 1: Jurisdictions shall recruit sufficient staff to operate all the planned PODs in the jurisdiction at the levels of throughput required to meet the CRI timeline.

Standard 3.3, Alternative 2: Jurisdictions shall recruit sufficient core staff and provide plans for recruiting and training spontaneous, unaffiliated volunteers in sufficient numbers to operate all the planned PODs in the jurisdiction at the levels of throughput required to meet the CRI timeline.

Standard 3.4, Alternative 1: Jurisdictions shall assess the availability of all staff on their call-down rosters on a quarterly basis via a no-notice call-down drill.

Standard 3.4, Alternative 2: Jurisdictions shall assess the availability of the core staff on their call-down rosters on a quarterly basis via a no-notice call-down drill.

After briefly outlining overarching considerations, this chapter presents the recommended standards, including the rationale behind the standards, suggested documentation requirements, and outstanding issues to be resolved.

³⁴ We will generically refer to the persons operating the PODs as “POD staff,” regardless of formal or legal employment status. In an emergency, POD staff are likely to be drawn from health departments, other government agencies, private companies, and, especially, from among pre-identified or spontaneous volunteers, among other sources.

CONSIDERATIONS INFORMING DEVELOPMENT OF RECOMMENDED STANDARDS

Analysis based on computer models of PODs informed development of the standards. Not surprisingly, decisions about staffing are closely related to decisions about other elements of POD planning. We describe the key findings from this analysis as well as other considerations noted by the panel.

Panelists were asked to consider the staffing requirements of the various POD designs that might form the basis of standards for internal POD operations. Based on this review and on a review of literature on PODs, we specified six notional POD designs that varied in terms of (1) the number of steps performed, (2) the time spent on each step (processing time), and (3) the level of medical training normally required. These options, shown in Table 5.1, range from one in which most of the POD tasks are staffed primarily by medically trained professionals (Option 1) to one in which only a few (or none) of the POD tasks are staffed entirely by non-medically trained people (Options 3 through 6).

Table 5.1: Notional POD Designs

<i>POD Task</i>	<i>Notional POD Designs</i>					
	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
		<i>Eliminate Briefing</i>	<i>Reduce Medical Level</i>	<i>Shorten Process</i>	<i>Reduce Medical Level</i>	<i>Eliminate Steps</i>
Entry greeting and triage	Allied health	Allied health	Nonmedical	Nonmedical	Nonmedical	Nonmedical
Briefing	Nonmedical	--	--	--	--	--
Form distribution	Nonmedical	Nonmedical	Nonmedical	Nonmedical	Nonmedical	--
Form check and direct to R/Y/G	Nonmedical	Nonmedical	Nonmedical	Nonmedical	Nonmedical	--
Interview and screening (Red)	Nurse	Nurse	Nurse	Nurse	Nonmedical	--
Interview and screening (Yellow)	Nurse	Nurse	Nurse	Nurse	Nonmedical	--
Interview and screening (Green)	Nurse	Nurse	Nonmedical	--	--	--
Dispensing (Red)	Pharmacist	Pharmacist	Nonmedical	Nonmedical	Nonmedical	Nonmedical
Dispensing (Yellow)	Pharmacist	Pharmacist	Nonmedical	Nonmedical	Nonmedical	Nonmedical
Dispensing (Green)	Pharmacist	Pharmacist	Nonmedical	Nonmedical	Nonmedical	Nonmedical
Exit	Nonmedical	Nonmedical	Nonmedical	Nonmedical	Nonmedical	Nonmedical

We used computer models to estimate the staffing requirements of each notional design. Figure 5.1 shows staffing requirements assuming a throughput of 500 persons per hour. The decreasing height of the bars from left to right shows that decreasing the number of tasks performed and reducing the medical training required to perform them can reduce total staffing needs by 25 to 50 percent, depending on the option selected, and can nearly eliminate the need for medical staff to perform POD functions. Hence, we see that computer models are useful tools to estimate the impacts of POD design and the staff training level required per task on the number of required POD staff of each type (e.g., nurses, pharmacists, allied health).

More information about the modeling used to generate the results shown in Figure 5.1 can be found in Appendix D.

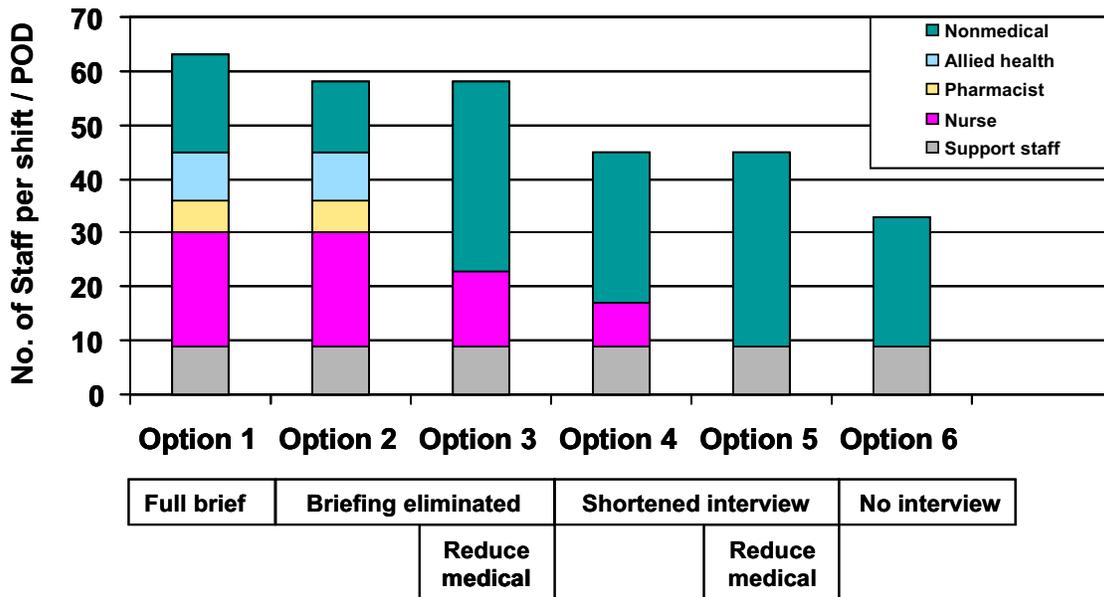


Figure 5.1: Reducing POD Steps and Medical Training Requirements Reduces Staffing Needs

The expert panel discussed each of the POD steps identified in Table 5.1, as well as modeling results on staffing implications of each model. While the panel did not clearly endorse any particular model, it clearly leaned toward those models requiring fewer medically trained staff, fewer staff overall, and fewer steps.

Staffing Requirements Depend on the POD Design and Required Throughput

The number of persons per hour who can be given prophylaxis at a POD (POD throughput) depends on the number of staff at the POD and the complexity and number of steps performed at the POD (POD design). In general, for a given set of steps, increasing the number of staff members serving people at the POD will increase the throughput of the POD. Figure 5.2 illustrates for each of the POD designs (Options 1 through 6 in Table 5.1) how increasing the number of staff members per shift increases the achievable throughput of the POD. Standards on POD staffing, therefore, must take into account the throughput required at each POD. As this may vary from POD to POD, and even within a jurisdiction, standards need to be flexible enough to take into account differences in POD design and the required throughput of each POD.

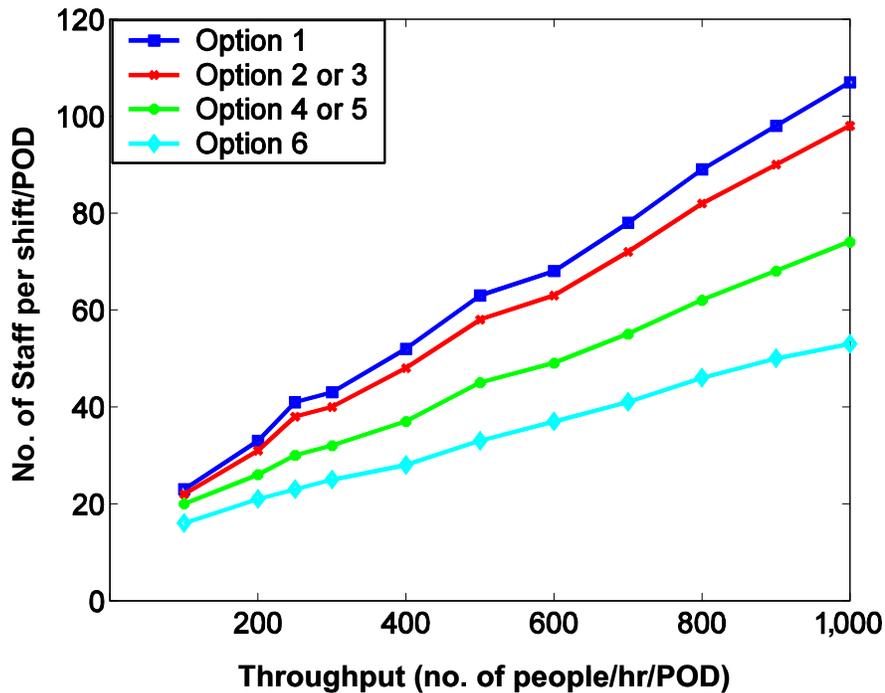


Figure 5.2: Staffing Requirements Depend on POD Design and Required Throughput

Required Throughput at Each POD Depends on the Number and Location of PODs

As noted in the standards on POD location in Chapter Three, mass prophylaxis plans must take into account variations in population density within the jurisdiction. The throughput required at each POD will depend on the number of people the POD must serve. Because the required throughput will help determine the number of staff needed, standards on staffing must take into account the number of people who will go to each POD.

SYNTHESIS OF PANEL DISCUSSION

The expert panel was shown analyses illustrating the considerations discussed here and was asked how standards might address the diversity of practices found in the field. As with the other sets of standards, panel members were concerned that uniform, one-size-fits-all staffing standards would not be appropriate and felt that standards mandating one specific approach to POD design and staffing would unnecessarily require jurisdictions to undo useful work already completed. Some panel members, however, expressed the desire to establish at least some set requirements so that jurisdictions would be held accountable for their ability to dispense prophylaxis at rates necessary to serve their entire population.

The panel reached consensus on the need for standards built around a “show-me” approach, i.e., jurisdictions would not be required to staff their PODs in a prescribed way, but instead would need to demonstrate the viability of their plans for staffing PODs.

STANDARD 3.1: ESTIMATING THE REQUIRED THROUGHPUT AT EACH POD

Recommended Standard

The first step in determining the staffing required for PODs is to determine the throughput that will be required at each POD. This requires an estimate of the number of people who will likely come to *each* POD seeking prophylaxis. The intent of this standard is to require jurisdictions to perform this analysis.

Standard 3.1: Jurisdictions shall estimate the number of individuals who are likely to visit each POD location and determine the required hourly throughput at each POD.

Explanation

If jurisdictions do not calculate the expected number of individuals who will visit each POD and adjust their staffing plans accordingly, then PODs in dense areas subject to above-average demand are likely to be overwhelmed during actual operations while PODs in sparse areas with lower-than-average demand may have more staff than needed.

As with the other standards, when considering staffing standards, expert panelists gravitated away from fixed numerical standards and toward standards that provide flexibility in responding to variations in POD models, the types of individuals available to work in PODs, and other elements of community context. This standard requires a POD-by-POD assessment of expected demand and, thus, of required throughput. The first part of the analysis required by this standard, estimating the number of people likely to visit each POD, builds upon the analysis required in Standard 1.1 (see Chapter Three), which called for an estimate of the number of persons likely to visit PODs, broken out by geographic region. That standard requires jurisdictions to determine the population for which they are responsible and allows them to adjust the population estimate to account for push strategies, head-of-household dispensing, and the postal option.

It should be noted that the standard does *not* require individuals to be assigned to PODs, only that plans are based on *estimates* of the number of individuals *likely* to come to each POD.

Suggested Documentation

We recommend that jurisdictions be required to supply the following documentation as evidence of compliance with the standard:

1. **POD assignment plan, if applicable:** Jurisdictions shall document whether groups of people will be directed to specific POD locations (for example, based on their residential zip code) or whether individuals will be allowed to choose the most convenient POD location (typically the closest). If residents are to be assigned to specific POD locations, the jurisdiction should append a plan that specifies the assignment rules. Once again, the standard does not require assignment of individuals to PODs.
2. **Demand estimate, by POD:** The jurisdiction shall provide an estimate of the number of people who will go to each POD, listed by POD. The result should also be totaled for all PODs, and this total should correspond to the total number of people in the jurisdiction who will be coming to PODs. Note that the number of individuals who will come to PODs will depend, in part, on whether the jurisdiction plans to use a head-of-household (multiple-regimen) dispensing plan.
3. **Required throughput, by POD:** The jurisdiction shall determine the required throughput for each POD, listed by POD. This shall be done for each POD. Required throughput is determined by taking the number of people who will go to each POD, as determined in step 2 (demand estimate), and dividing it by 24 hours. (The estimate of 24 hours comes from the 48-hour CRI goal, minus 12 hours from CDC to warehouse, minus 12 hours for transport from warehouse to PODs. Jurisdictions may use different estimates for these transportation times.)

Example: If assignments are based on zip codes, the assignment plan could be presented as follows:

POD Location	Zip Code	Population	Required Hourly Throughput
Location 1	A, B, C	12,000	500 per hour
Location 2	D, E, F	18,000	750 per hour

Remaining Issues and Options Related to the Standard

The issues raised by CRI sites regarding this proposed standard were essentially the same issues raised with regard to Standard 1.1 in Chapter Three.

There was debate as to whether the standard should mandate a definition of the population for which a jurisdiction is responsible. The standard presented here is consistent with Standard 1.1 in allowing jurisdictions to determine for themselves the population for which they will be responsible. However, decisionmakers may want to consider providing more specificity in future versions of the standards.

As in the case of Standard 1.1, CRI sites raised the concern that the detailed population analysis, as well as the assignment (for planning purposes) of population to PODs, would be beyond the skill and capacity of many jurisdictions. Analysis of population data at this level of detail is typically performed using GIS software. Many jurisdictions may not have the technical or human resources necessary to conduct this analysis efficiently.

Another concern raised by a reviewer was that the calculation of required hourly throughput for each POD effectively assumes that the population in each area will show up at the POD at an even rate over the course of the dispensing operation. In reality, there will likely be surges in the arrivals that will depend on behavioral factors that are difficult to predict: when the public receives word of the need for mass prophylaxis, the instructions given in the public information campaign, how the public complies with such instructions, when people choose to come to the POD, and so on. We were unable to find evidence in the literature that would indicate just how the public would respond in an emergency in terms of their arrival patterns at a POD. However, it does seem unlikely that arrival rates would be even, in spite of efforts to use public information campaigns to discourage people from coming to the PODs all at once. Unfortunately, we know of no clear solutions to this problem. Thus, jurisdictions should be encouraged to plan for more than the minimum required throughput. Given that the proposed standards are minimums, however, we are not recommending increases beyond that in this standard.

STANDARD 3.2: ESTIMATING THE STAFF REQUIRED AND THROUGHPUT ACHIEVEABLE AT PODS

Having required jurisdictions to estimate POD-by-POD demand (Standard 3.1), this standard requires them to estimate staffing requirements for each of those PODs. Rather than mandating a particular staffing configuration, this standard adopts a “show-me” approach, allowing jurisdictions to demonstrate that their POD designs and staffing configurations will produce the necessary throughput.

Standard 3.2: Jurisdictions shall determine and verify the number of staff required to administer prophylaxis to the population (identified pursuant to Standard 1.1) by conducting drills with time studies.

Explanation

Members of the expert panel recognized the need to ensure sufficient staffing levels but were concerned about maintaining flexibility for jurisdictions, rather than adopting a one-size-fits-all approach

that would mandate a particular POD design, staffing configuration, and minimum throughput. A method was needed to allow jurisdictions to verify the required staffing and achievable throughput of each jurisdiction's own POD designs.

One possibility was the use of computerized mathematical models of PODs. Panelists agreed that these models could be used to estimate staffing requirements for individual POD designs, but several pointed out that these models have not been sufficiently validated to serve as the sole basis for standards. Most panelists also pointed out that mathematical models are no substitute for realistic tests of POD staffing plans through drills.

Drills also have weaknesses, the panelists pointed out. POD drills are expensive to conduct and require many people to run. Panelists noted that it is often difficult to get enough volunteers involved in exercises to play the role of clients to truly stress the POD's capabilities. Without sufficient volunteer clients in a POD drill, measurements of the throughput that can be achieved will not be valid, since the rate of people being processed by the POD will be limited by the low numbers of people coming to the POD in the first place.

The panel consensus was that standards should be based on performance demonstrated during a drill, supplemented by time studies and (if needed) the use of computer models: Jurisdictions are to use POD exercises to measure the **throughput** of the POD (the number of individuals per hour who can be given prophylaxis at the POD). During those same exercises, jurisdictions are to do a time study to collect **processing time** data: For each station, they would measure the amount of time it takes for the station to process each client. This timing data can be used to facilitate process improvements and provide a basis for computer models, which can provide additional throughput estimates to supplement the throughput observed in the drill. Computer models are especially helpful when drill conditions do not provide for a good measurement of the POD's throughput capabilities (e.g., there is an insufficient number of patients to stress the POD).

Procedures for Meeting the Standard

This section presents a more detailed discussion of the drill- and model-based methods.

Drill with time study (required). Jurisdictions should conduct a POD drill to demonstrate that the required **throughput** can be achieved with the planned POD design, process steps, protocols, and staffing level that would be used in the CRI scenario. If the protocol calls for head-of-household pickup, then the drill should accordingly assume that the persons coming to the POD for prophylaxis are picking up prophylaxis for their respective family members. As noted earlier, a challenge often faced when using drills to estimate the throughput of a POD is the lack of sufficient volunteers to serve as the persons receiving prophylaxis. Jurisdictions should attempt to recruit enough people so that some crowding may be observed

at the POD. If a POD is able to enlist only small numbers of people to receive prophylaxis, drill controllers may wish to group them together and send them through all at once so that, at least for a brief period, the POD will be busy and a throughput number can be estimated during that busy period.³⁵

Jurisdictions should also plan to measure the **processing time** for each of the different types of stations (e.g., screening, express dispensing, assisted dispensing) in the POD during their drills. Jurisdictions should have at least one evaluator posted at each type of station to record the time it takes for a worker at that station to serve each client from start to finish (not counting the client's time spent waiting in line). To ensure a good sample of the process time at each step, evaluators should take as many observations as possible from several different workers at that station. From these observations, the jurisdiction should calculate, for each type of station in the POD, the average processing time per client for that station and, if possible, the standard deviation of processing time per client for that station.³⁶

Computer model (optional supplement). Jurisdictions may use the time-study information that was collected in the drill as inputs in a computer model, which will give an estimate of the maximum possible throughput of the POD. This provides an alternate estimate of throughput that is useful in the event that unforeseen shortages of mock patients and other factors prevent the observation of reliable throughput counts during the POD drill. Computer models are also useful for enabling “what-if” analyses to improve the POD design in between POD drills.

Possible computer models include

- BERM (Weill Medical College, Cornell University) (AHRQ, 2005)
- Clinic Generator (University of Maryland) (ISR, 2008)
- RealOPT (Georgia Institute of Technology) (ISYE, 2006).

Using a computer model requires jurisdictions to input the design of their POD: listing the stations that each client goes through (e.g., forms, screening, dispensing), the number of staff at each station, and the average *processing time* for a person at each of the stations in the POD. The computer model then uses this information, along with information about the rate at which clients arrive at the POD, to calculate estimates of the average throughput, the length of the lines at the POD, and time spent waiting in line.

³⁵ One reviewer suggested that this tactic of intentionally bunching up persons going through the POD should be standard practice for exercises as a way of testing the ability of a POD to respond to surges of arrivals.

³⁶ CDC's recent Web casts on mass antibiotic dispensing provide a useful resource for those wishing to learn more about conducting time studies and using computer models. See, for instance, CDC (2005a, 2005b, 2006, 2007a).

NOTE: Many computer models estimate only the “contact” staff required, i.e., the number of staff engaged in activities through which they interact directly with the person receiving prophylaxis, such as distributing forms, performing interviews, or dispensing prophylaxis. Some models omit the support staff (e.g., translators, runners, guides, inventory managers), supervisors, and command staff required.

Consequently, jurisdictions may have to separately estimate the number of additional staff required if the computer model does not do so.

Other standards described in this report ensure that the required throughput is consistent with the population that will be coming to each POD and the number of hours that the PODs will be in operation. Once an estimate of the number of staff required at each POD has been constructed, these estimates can be totaled and multiplied by the number of shifts to give the total number of staff required to operate all the PODs in the jurisdiction’s mass prophylaxis plan.

Suggested Documentation

We recommend that jurisdictions be required to supply the following documentation as evidence of compliance with the standard:

1. **Table of PODs:** Jurisdictions shall construct a table listing all the PODs in the mass dispensing plan. For *each* POD, sites shall document
 - POD name or identifier
 - demand estimate (number of people who will visit this POD)
 - required throughput (as calculated in Standard 3.1)
 - staff required to operate one shift of this POD and the estimated throughput
 - method by which the staff estimate was generated (exercise date or model name)
 - number of shifts of distinct staff (number of shifts per day, assuming that staff will return for another shift on subsequent days)
 - total number of staff required to operate the POD through the entire mass prophylaxis campaign.
2. **Total number of staff required for entire jurisdiction:** This is the sum of the estimated staff required for each POD, totaled for all PODs in the jurisdiction’s mass prophylaxis plan.
3. **Details on the drill:** Jurisdictions shall document
 - POD flow plan, showing the different stations in the POD and how clients are routed
 - how many staff were used, listed by role and/or station
 - when the drill was performed
 - total number of clients processed during drill
 - total length of time of drill
 - if a specific measurement period is used to estimate throughput:

- number of clients processed during measurement period
 - length of measurement period
 - number of timers employed, and a brief description of timing method used
 - estimated processing time per client for each station, as observed by timers (means and standard deviations).
- 4. Details on the computer model used, if applicable:**
- name or description of computer model used
 - computer-generated estimates of staff required, listed by role and/or station.
- 5. Recommendation and justification regarding which estimates are more credible:** If a jurisdiction exercises the option to generate computer-based throughput estimates and believes that these are a more valid representation of its dispensing capability, it should provide an explanation justifying this choice. For example, computer-based estimates might be recommended if the number of clients in the drill was insufficient to provide a directly observed measurement of throughput. Computer-based estimates may also be preferred if, as a result of drill and computer modeling efforts, the jurisdiction has made improvements to its POD design or changes in staffing that were not reflected in the most recent drill. However, drill-based estimates are generally the preferred method and should be used whenever possible.

Planning for “Buffer” Staff

Results from either computer models or drills will tend to underestimate the number of staff required at PODs in an actual emergency.³⁷ This suggests that jurisdictions should increase their estimates

³⁷ Computer models can miss factors that would be important in a real-world emergency: Many assume that staff know their jobs and do not tire, that persons receiving prophylaxis do not get lost within a POD, and so on. Users of computer models can compensate by adjusting the parameters to incorporate these factors. Furthermore, obtaining estimates of parameters even under ideal conditions can be challenging. Nonetheless, computer models provide valuable guidance, particularly if one performs multiple runs under varying assumptions, allowing planners to see how staffing and throughput estimates can change.

Drills and exercises capture more of these real-world factors, but even they are performed in shorter duration and under more ideal circumstances than will actually be the case. Volunteers receiving prophylaxis in drills are typically healthy adults, and even if they are told to play roles, they may not truly represent the range of ages and abilities of the people who actually visit a POD should a CRI scenario occur. Staff performance in an actual emergency will also differ, since over the course of a shift, staff may become more efficient as they perform their tasks but then slow down as they fatigue. In a real situation, staff would need breaks, and staff may not even show up. Consequently, more staff would be needed to serve as relief or backups. (See Spitzer et al, 2007.)

of the required number of staff.³⁸ However, we could not find sufficient data or evidence to warrant the setting of any specific buffer percentage. Consequently, while jurisdictions are encouraged to increase their staffing and throughput beyond what is required in this minimum standard, we have not recommended any mandated additions in the standard.

Remaining Issues and Options Related to the Standard

Feedback from panel members and CRI sites was generally positive, especially with regard to the multiple options given for sites to demonstrate compliance. Still, some concerns were raised.

There was considerable disagreement among respondents about whether jurisdictions should be given a choice between using exercises or computer models to demonstrate required staffing, or whether drills should be preferred. Some believed that choice between the options is reasonable given the aforementioned problems in using drills, while others pointed out that sites should already be conducting regular dispensing drills as part of their normal preparedness efforts.

There was also concern about some health departments' ability to use computer models. While some departments are familiar with computer models and already use them as part of their POD design process, others are not. Indeed, it seems likely that CDC would have to provide technical support to some jurisdictions in the use of computer models in order to make this option feasible.³⁹ It appears that the technical burden of using available POD staffing models is not as large as with the location models and GIS software described in Chapter Three. Nonetheless, HHS and CDC may need to invest personnel and resources to assist jurisdictions in learning how to use these models.

STANDARD 3.3: RECRUITING SUFFICIENT STAFF FOR PODS

The intent of this standard is to ensure that, having determined the number of staff required (via Standard 3.2), jurisdictions will identify and recruit the staff necessary to implement their mass prophylaxis

³⁸ Furthermore, as noted in the discussion of Standard 3.1, the estimate of the required throughput is based on the assumption that people will come to the POD at a constant, even rate over the course of the POD's operation. In reality, there will likely be surges in arrivals that will depend on behavioral factors that are difficult to predict. These surges will cause lines to form at or outside the POD despite efforts to size and staff PODs according to the estimated throughput required.

³⁹ Some panel members suggested the construction of a table that would detail a POD's required minimum staffing level as a function of the size of the jurisdiction or the throughput of the POD. By running computer models, a table could be constructed that would give the staff requirements for a given list of POD steps and processing times as a function of the POD's required throughput. However, the wide range of possible POD designs (choices of steps and processing time at each step) makes it impractical to compile the results into a single table without mandating a single POD configuration or aggregating the results to the point of not being useful. Further work could be done in this area to overcome these barriers.

plan and enter them into a call-down roster. Given that there was neither a clear analytical basis for nor a consensus around a single standard, we present two alternatives for consideration.

Standard 3.3, Alternative 1: Jurisdictions shall recruit sufficient staff to operate all the planned PODs in the jurisdiction at the levels of throughput required to meet the CRI timeline.

Standard 3.3, Alternative 2: Jurisdictions shall recruit sufficient core staff and provide plans for recruiting and training spontaneous, unaffiliated volunteers in sufficient numbers to operate all the planned PODs in the jurisdiction at the levels of throughput required to meet the CRI timeline.

Explanation

Ideally, jurisdictions would have all the POD staff they need on a call-down list, ready at a moment's notice. This would help ensure that POD staff could be called, assembled, trained, and able to set up the PODs by the time materiel arrives from CDC through the state and local warehouse and distribution network. (We estimate that this would be somewhere between 12 and 24 hours.)

We received feedback from panel members and CRI site representatives that a standard requiring *all* persons to have been pre-recruited would be impossible to meet. Individuals from some large jurisdictions felt that it was impractical to have one list with the thousands of individuals needed to execute a mass prophylaxis plan. Instead, their mass prophylaxis plans had been designed to rely on aid from other government agencies, community and volunteer organizations, and spontaneous, unaffiliated volunteers who would receive just-in-time training.

Given the lack of evidence about the effectiveness of jurisdictions' just-in-time recruiting plans, we have presented *two alternatives* for a staff recruitment standard. The first alternative requires all staff to be recruited and listed. The second alternative requires only *core* staff to be recruited and listed beforehand and requires that plans for just-in-time recruiting and training of the remaining necessary staff be documented.

Definitions of what constitutes "core" staff vary. Some departments intend that their employees would form the core staff for each POD, to be supplemented by volunteers. Others suggested that the core staff would mean the command staff at each POD, who may be pre-recruited, trained volunteers. Defining core staff could be delegated to those evaluating awardees or left to jurisdictions' discretion. A reviewer noted that in the absence of clear guidance about what constitutes "core staff," opting for Alternative 2 could result in an extremely weak standard.

Suggested Documentation

Jurisdictions would provide for inspection a call-down roster containing names and contact information of POD managers, staff, and volunteers. Jurisdictions intending to draw from municipal workers for disaster service may present those rosters as part of demonstrating compliance. Jurisdictions should ensure, however, that these other employees will not be required to perform critical functions in their normal jobs. Jurisdictions might also be required to provide copies of agreements with volunteer and community-based organizations, especially if the decision is made to adopt Alternative 2, which requires recruiting only “core” staff.

STANDARD 3.4: ASSESSING AVAILABILITY OF POD STAFF

This purpose of this standard is to ensure that jurisdictions can promptly contact and assemble the required number of people to staff PODs within the first few hours of the decision to conduct mass prophylaxis. Jurisdictions would be required to test this ability. Once again we have presented two options: one requiring call-down of all staff and the other requiring call-down of core staff only.

Standard 3.4, Alternative 1: Jurisdictions shall assess the availability of all staff on their call-down rosters on a quarterly basis via a no-notice call-down drill.

Standard 3.4, Alternative 2: Jurisdictions shall assess the availability of the core staff on their call-down rosters on a quarterly basis via a no-notice call-down drill.

Explanation

Any delay in assembling staff and setting up PODs will delay dispensing operations, putting a greater burden on PODs to administer prophylaxis to the entire population in the remaining portion the 48-hour time window (previously estimated as 36 hours).

The call-down drill serves several purposes: Running the drill verifies the accuracy of the names and contact information of the staff on the jurisdiction’s list. The drill also tests the ability of the jurisdiction to call POD staff in a timely manner when needed. Finally, it gives an estimate of the percentage of staff who would not be available on a given day; jurisdictions should use this information to estimate how many backup staff they would need to recruit.

The recommended standard requires jurisdictions to conduct quarterly call-down drills as a means to periodically review the contact information and willingness to serve on the part of POD staff. The requirement for a quarterly test is based on CDC DSNS's TAR tool.

The no-notice requirement is intended to gauge the availability of POD staff to report on any random day without prior warning. Drills would be conducted *without* prior notice, but to avoid placing undue burden on call-down list members, staff would *not* be required to physically assemble for duty. In the drills, jurisdictions would record whether each staff member is reachable and whether staff members report that they would have been able to report for duty had the call been for a real emergency.

As described in Standard 3.3, regarding the number of staff who must be recruited, some large jurisdictions do not intend to pre-recruit the entire staff necessary to operate all the PODs in the mass prophylaxis plan. Some jurisdictions intend to rely on aid from other agencies, activation of their municipal employees for emergency duties, or recruiting spontaneous volunteers on a just-in-time basis. For this reason, we present two alternative standards on the pool of staff to be called in a call-down drill, consistent with the alternatives presented in Standard 3.3.

Suggested Documentation

Jurisdictions should perform call-down drills quarterly and document the results of the drill, including

1. number of staff on call-down list
2. call-down method (e.g., manual, automated, calling tree)
3. percent confirmed reached
4. percent reporting that they would be available to report for duty had this been a real emergency call-down
5. time necessary to perform call-down
6. time necessary to receive acknowledgements from those called.

Remaining Issues and Options Related to the Standard

A concern was raised by CRI site representatives that, even if a jurisdiction had most or all of the staff recruited, it would not be practical to call all of them, particularly each quarter, as specified in the proposed standard (and in the SNS TAR tool). While core POD staff, employees of the health department, and some volunteers (such as Medical Reserve Corps members) might expect regular drills, other employees and volunteers may consider such drills too burdensome.

One possible strategy would be to allow jurisdictions to use sampling methods. Instead of calling the entire list, jurisdictions might call a random sample of staff from each pool (e.g., health department employees, Medical Reserve Corps members, other municipal employees, other volunteers). Statistics

regarding the time and effort required to call the entire list and the percentage of staff members who are reachable and could report in an emergency could then be extrapolated from this sample.⁴⁰

SUMMARY AND CONCLUSIONS

This chapter described recommended standards for POD staffing. As with recommended standards for the number and location of PODs and internal POD operations, the staffing standards require jurisdictions to undertake an auditable analytical process rather than providing inflexible numerical targets. Specifically, the standards require jurisdictions to estimate POD-by-POD demand (Standard 3.1) and staffing needs (Standard 3.2). The standards also require jurisdictions to recruit the number of staff identified in the previous standard (Standard 3.3) and conduct regular call-down tests (Standard 3.4).

⁴⁰ In a separate project with HHS ASPR, RAND has been developing drills that will incorporate such sampling techniques.

6. RECOMMENDED STANDARDS ON POD SECURITY

OVERVIEW

The main challenge in developing appropriate standards for POD security is to ensure that a comprehensive set of security measures is in place while also ensuring that the measures are not overly prescriptive in terms of how security operations are conducted. The latter point is especially important for security because many of the required security functions (e.g., crowd and traffic control) are provided by organizations outside of the traditional public health community and are conducted according to established standard operating procedures specific to each organization.

With these principles in mind, we recommend the following standards on POD security. In the case of Standards 4.2 and 4.3, there was neither a clear analytical basis for nor a consensus around the level of stringency required by the standard, and, as a consequence, we present two alternatives for consideration by decisionmakers.

Standard 4.1: Site security assessments shall be conducted at every POD location in coordination with the agency or agencies responsible for security functions at the PODs.

Standard 4.2, Alternative 1: The agency or agencies responsible for security functions at PODs shall be consulted on *and approve* the security aspects of the overall mass prophylaxis plan.

Standard 4.2, Alternative 2: The agency or agencies responsible for security functions at PODs shall be consulted on the security aspects of the overall mass prophylaxis plan.

Standard 4.3, Alternative 1: Law enforcement in the form of sworn, uniformed officers shall maintain a physical presence at each POD location.

Standard 4.3, Alternative 2: Law enforcement in the form of sworn, uniformed officers shall maintain a physical presence at each POD location. This requirement may be waived with a written attestation from the parties responsible for POD security. The attestation shall include evidence that compliance with the standard as written is infeasible and that alternate measures designed to ensure adequate security are in place at each POD site.

This chapter provides a brief overview of some overarching considerations in setting standards on security operations in PODs, then discusses each standard individually, including the rationale for the standard; the process for meeting the standard; and the issues, questions, and options that have been raised regarding the standard.

CONSIDERATIONS INFORMING DEVELOPMENT OF RECOMMENDED STANDARDS

Adequate security planning is essential to the safety of POD staff and clients, the sustainability of operations, and the safeguarding of countermeasures being dispensed. A stable POD environment will enable successful countermeasure dispensing at a given facility and will have a broader influence on a

jurisdiction's ability to meet the public health mission of mass prophylaxis. If a POD environment were to appear unsafe, the public might choose to go to other PODs that are considered safer, thus stressing operating conditions and challenging dispensing operations at multiple facilities. Similarly, POD staff might refuse to work at unsafe PODs. Thus, the failure of security at a single POD could threaten not only that POD but possibly the entire jurisdiction's mass prophylaxis mission.

The scope of what is defined as security for POD planning encompasses all of the essential security capabilities outlined in the SNS program guidance (CDC, 2007b) including

- providing law enforcement and fire control
- safeguarding and controlling access to restricted areas
- maintaining vehicle traffic control
- facilitating orderly entrance to and exit from the POD
- providing crowd control within and outside of the POD
- maintaining command-and-control capability for security staff
- coordinating intra-POD security operations as well as security operations between PODs and local law enforcement
- coordinating facility parking and ensuring adequate water, sanitation services, and heating or air conditioning, as required.

Discussions with law enforcement representatives revealed that state and local law enforcement agencies often have in place policies, procedures, and doctrine for performing many of these tasks. As outlined in Chapter Two, specific standards on the number, training, and coordination of security personnel must take into account the evidence base supporting the standards as well as opportunities to allow POD responses in each community to be tailored to the existing policies, procedures, and doctrines. Standards are needed to ensure that the security planning process for each jurisdiction considers and addresses the essential security measures called for to enable dispensing operations.

Jurisdictions Vary in Reliance on Sworn Law Enforcement

Discussions with law enforcement personnel and a survey of the 21 original CRI cities suggests that jurisdictions are planning for all the security capabilities identified by CDC SNS planning guidance. However, many jurisdictions were planning to rely on private security personnel (provided by either security companies or the host facility security staff), along with sworn, uniformed law enforcement officers,⁴¹ to provide all security capabilities. CRI jurisdictions have incorporated these non-sworn

⁴¹ *Sworn, uniformed officers* refers to active-duty law enforcement personnel who have been vested with arrest authority.

personnel into their security plans in a variety of ways. We identified four main strategies for using non-sworn personnel and show examples of personnel assignments for each of the strategies in Table 6.1.

Table 6.1: Examples of Approaches Used by Awardees to Provide Security Capabilities at PODs

Security Capability	Sworn Officer Only	Sworn Officer Heavy	Mixed Strategy	Sworn Officer Light
Public security/law enforcement			Sworn officer	Sworn officer
Access control		Sworn officer	All types of personnel	
Vehicle traffic control	Sworn officer			
Internal crowd control			Professional security & volunteers	Professional security & volunteers
External crowd control		Professional security & volunteers		
Parking			All types of personnel	

Of the 12 responses received from CRI sites, fewer than half employed a *sworn officer-only* strategy. The majority relied on some form of personnel other than sworn officers to provide some aspects of security, with a roughly even distribution among the *sworn officer-heavy*, *sworn officer-light*, and *mixed* strategies.

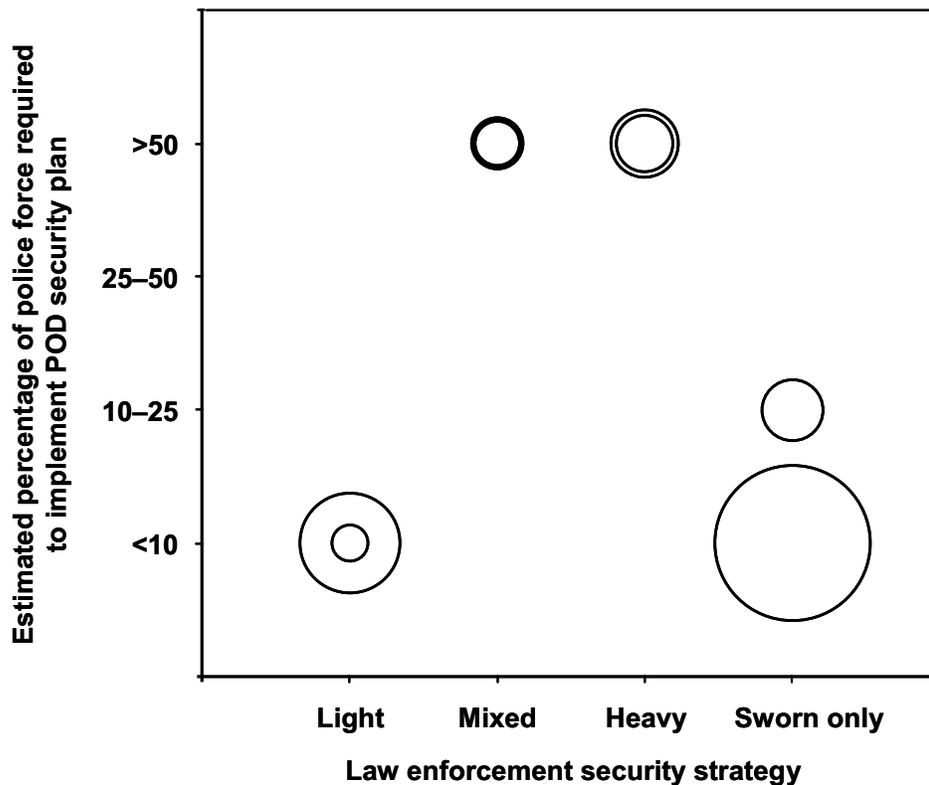
Standards on security should be mindful that not all security roles need to be performed by sworn law enforcement officers; volunteers are often used to manage the flow of traffic and people, for example. However, standards also need to recognize that some functions, such as maintaining public security and law enforcement, are generally reserved solely for sworn officers.

Approaches to Security Must Be Aligned with Availability of Security Personnel

The feasibility of implementing security is largely dependent upon having adequate numbers of personnel to carry out the required tasks. If a jurisdiction decides to rely heavily on sworn law enforcement

officers, the success of the plan might require a large percentage of the local police force to be available to PODs.

We asked CRI sites to estimate the percentage of the police force they would need for POD security duties during a CRI response. The seven responses are shown in Figure 6.1. Many jurisdictions chose approaches that align well with the availability of security personnel, but in a few jurisdictions, responses suggest that implementing the security plan may prove infeasible because of the lack of sworn, uniformed law enforcement personnel.



NOTE: Circle size is proportional to the number of sworn officers on the site's police force.

Figure 6.1: Variation in Adopted Security Approach by Estimated Availability and Size of Police Force

For sites with very large police departments, security is unlikely to be a binding constraint in POD planning. Of the two responses from awardees with large police departments (denoted by larger circles in Figure 6.1), one site used a *sworn officer-only* strategy, while another site used a *sworn officer-light* strategy. In both instances, the sites estimated that only 10 percent of the entire police force would be required for POD duties.

For smaller MSAs with smaller police departments (denoted by smaller circles in Figure 6.1), implementing security may be more challenging. One site with a small department adopted a *sworn*

officer–light strategy. However, two sites adopted *mixed* or *sworn officer–heavy* strategies, which would require upwards of half of the police force to be available for POD security. Because police departments will have many duties to carry out during an emergency, plans that require the majority of a police department to be available for POD duty place the site in a potentially untenable position.

Standards mandating sworn law enforcement presence at PODs must be mindful of the burden that this could place on available police resources.

SYNTHESIS OF PANEL DISCUSSION

These considerations were presented to the expert panel and a facilitated discussion followed. The discussion coalesced on the following principles for guiding the development of standards:

- Security is essential to a community’s ability to complete the CRI mission successfully.
- Early and substantive collaboration between public health and public safety entities is necessary to integrate security into CRI planning. To achieve this collaboration, effort is required to make CRI planning a partnership among all responsible parties.
- Conducting site security assessments for all potential POD facilities is a foundation of the security plan.
- Security for CRI planning goes beyond the provision of site security personnel. For example, the expert panel noted that effective security also requires an adequate communications plan including a focus on providing continuous and appropriate messages for the public as well as the capability for interoperable communication among responder organizations.

STANDARD 4.1: POD SITE SECURITY ASSESSMENTS

Standard 4.1: Site security assessments shall be conducted at every POD location in coordination with the agency or agencies responsible for security functions at the PODs.

Explanation

Discussions with the expert panel and security experts supported the SNS planning guidance (CDC, 2007b) recommendation that security assessments be conducted at every facility under consideration as a POD location. The expert panel asserted that effective security requires substantial collaboration between

public health and public safety communities. Consequently, the standard requires site assessments to be coordinated, at a minimum, with the health department and the agency or agencies responsible for security functions at the PODs (in most cases, the local law enforcement agency).

Review of this standard by CRI site personnel and public health experts revealed a concern that CDC not be too prescriptive about which organizations are required to participate in POD planning and security assessments. This concern was motivated by several factors.

First, discussions revealed significant variation in the types of organizations responsible for provision of security capabilities across CRI sites. Depending on the jurisdiction – and even the POD – security may be provided by local police departments, public health police departments, facility security personnel, private security companies, state or county police departments, or even volunteers. Second, discussions revealed a consistent preference for not wanting to vest any specific organization with veto power over the CRI planning process. Finally, experts associated with public health departments noted that public health departments typically do not have the ability to conduct security assessments or the authority to direct organizations that are capable of doing so.

Some of these concerns reflect a need for flexibility in standards to allow planning to align with the specifics of which agencies have the capacity and capability to perform various security functions in each jurisdiction. Other concerns are related to the challenges of initiating cooperation between public health and public safety communities that can arise because of budgetary and political pressures at the local level.

To address these issues, we worded the standard so that it does not specify which organization takes the lead in conducting security assessments or which organization is responsible for POD security. The standard thus allows jurisdictions flexibility in delegating responsibilities for planning in a manner that matches the resource availability and interagency relationships in the jurisdiction. However, the expert panel emphasized that public health departments need to work actively with the public safety community to develop incentives to improve the level of collaboration on public health emergency preparedness planning.

Suggested Documentation

Site security assessments should be conducted using methods consistent with the guidelines included in the SNS Planning Guidance.

In order to demonstrate compliance with the standard, jurisdictions should provide

- **documentation of the members of the team(s)** assigned to conduct site security assessments
- **description of the site security survey methodology** used
- **copies of site security assessments** (including data) conducted at all selected POD locations

- **documentation of review of POD security assessments** by the CRI or SNS coordinator and lead security official.

Remaining Issues and Options Related to the Standard

Review of this standard by CRI sites and public health experts revealed a concern that CDC not be too prescriptive about which organizations be required to participate in POD planning and security assessments. This concern was motivated by several factors.

First, discussions revealed significant variation in the types of organizations responsible for provision of security capabilities across CRI sites. Depending on the jurisdiction — and even the POD — security may be provided by local police departments, public health police departments, facility security personnel, private security companies, state or county police departments, or even volunteers.

Second, discussions revealed a consistent preference for not wanting to vest any specific organization with veto power over the CRI planning process.

Finally, experts associated with public health departments expressed concern about the public health community being held to standards for security because public health departments typically do not have the ability to conduct security assessments or the authority to direct organizations that are capable of doing so.

Some of these concerns reflect a genuine requirement for flexibility in standards that allows planning to align with interagency environments within a jurisdiction. Again, other concerns are related to the challenges of initiating cooperation between public health and public safety communities that can arise because of budgetary and political pressures at the local level. For these reasons, the standard was worded to be vague about which organization would take the lead in conducting security assessments and which organization would be responsible for security at PODs. This wording provides jurisdictions with flexibility to delegate responsibilities for planning in a manner that matches the resource availability and interagency relationships in the jurisdiction. However, the expert panel emphasized the importance of public health departments actively working with the public safety community to develop incentives for substantive collaboration on public health emergency preparedness planning.

STANDARD 4.2: REVIEW OF SECURITY ASPECTS OF THE MASS PROPHYLAXIS PLAN

The intent of this standard is to ensure that an appropriate security agency has reviewed all the security aspects of the mass prophylaxis plan.

Standard 4.2, Alternative 1: The agency or agencies responsible for security functions at PODs shall be consulted on *and approve* the security aspects of the overall mass prophylaxis plan.

Standard 4.2, Alternative 2: The agency or agencies responsible for security functions at PODs shall be consulted on the security aspects of the overall mass prophylaxis plan.

Explanation

Discussions with the expert panel emphasized the importance of security to successful completion of the mass prophylaxis mission and recommended that the parties responsible for security at PODs (law enforcement or otherwise) be consulted on the development of the POD plan and approve all security aspects of the plan. To address this concern, we recommend that security planning be coordinated with processes for determining POD locations. This requirement for consultation provides a link between security and requirements for site assessments found in the standards on the number and locations of PODs in Chapter Three.

There was some discussion among expert panel members as to whether the standard should require simple consultation or formal approval as well. Lacking either consensus among panel members, or any evidence base to sway the decision in one way or another, we present two alternatives for consideration by decisionmakers.

Suggested Documentation

The expert panel suggested that security aspects of the POD plan extend beyond providing public safety and facility security around the POD and that special attention be paid to several issues. Jurisdictions should provide a letter addressing each of the points listed here to indicate review (and/or approval) of the POD plan by all parties responsible for any aspect of security at any facility selected as a POD location.

- **POD selection and operation:** It is prudent to incorporate security into the process of selecting PODs and establishing the operational plans. The security perspective can facilitate selection of PODs that will be easier to manage. The security perspective can also provide suggestions on the process of moving people through the POD in ways that minimize risk to POD staff and materiel.
- **Communication efforts regarding POD operation:** Communication with the public is an integral part of effective security because clear and instructive communication can help

to ensure that citizens and POD staff make decisions during an emergency that are in the best interest of themselves and others. As such, security planning should be coordinated with the POD communication plan. A comprehensive communication plan should address the following three topics: (1) enabling interoperable communication systems; (2) providing guidance to POD staff on where to report and what to do before, during, and immediately after POD operations; and (3) providing information to the community about how to get to a POD, what to do once at a POD, what to expect when taking prophylaxis, and what to expect after receiving prophylaxis. If these topics are not adequately addressed, the potential exists for the community to lose confidence in the POD mission and subsequently for security around PODs to deteriorate.

- **Plans for providing transportation to and from PODs:** Transporting people to and from the POD may require closure of roads, increased security around mass transportation, or special provisions for parking. Transportation may be required for both POD staff and clients. In some jurisdictions, this may require participation of local law enforcement. In all cases, it is important to capture the perspective of security to ensure the feasibility of the transportation plan.

Because public safety resources available for planning and interagency agreements may vary across jurisdictions, consultation with security experts need not be limited to local law enforcement if the lead party for security is a private facility security organization, state law enforcement, or another organization or agency.

Remaining Issues and Options Related to the Standard

Public health department personnel who reviewed this standard cautioned that the standard not be too prescriptive of which organization is responsible for implementing planning and security as part of CRI. The motivations for this concern were the same as those raised about Standard 4.1. To accommodate these concerns and provide for flexibility in planning, the standard was written so as not to vest authority or responsibility in any specific organization. However, in choosing between the alternative standards proposed, *a policy decision will be needed to determine whether to require written approval of POD plans (either components or the plans in their entirety) by organizations outside of the public health community.*

STANDARD 4.3: PRESENCE OF SWORN LAW ENFORCEMENT OFFICERS AT EACH POD

The intent of this standard is to ensure law enforcement presence at each POD.

Standard 4.3, Alternative 1: Law enforcement in the form of sworn, uniformed officers shall maintain a physical presence at each POD location.

Standard 4.3, Alternative 2: Law enforcement in the form of sworn, uniformed officers shall maintain a physical presence at each POD location. This requirement may be waived with a written attestation from the parties responsible for POD security. The attestation shall include evidence that compliance with the standard as written is infeasible and that alternate measures designed to ensure adequate security are in place at each POD site.

Explanation

The survey of current security practices adopted by CRI sites indicates that many of the security tasks required at a POD facility can be provided by trained volunteers, private security staff, or other personnel besides sworn law enforcement officers. However, the expert panel emphasized the need for some level of sworn law enforcement presence at each facility because some tasks cannot be delegated. While the standard is not prescriptive of which tasks must be performed by sworn law enforcement officers, the most obvious tasks that cannot be delegated are arrest authority and command and control of security at a facility, which enable escalation of security capabilities or the ability to exercise arrest authority, if required. Use of non-sworn law enforcement officers for other tasks will depend on local laws and requirements regarding delegation to security authorities for specific tasks. For example, in some communities, only sworn law enforcement agencies can enforce street closures. The minimum number of sworn law enforcement agents and whether these officers must be dedicated to specific PODs will depend on standard operating procedures used by local law enforcement agencies and special provisions to these procedures that are arranged in advance to accommodate the demands of an anthrax attack or other scenarios.

Although there was a strong desire for a minimal presence to be required, there was also serious concern that this requirement would be infeasible for some jurisdictions. Lacking either consensus among panel members or any evidence base to sway the decision in one way or another, we present two alternatives for consideration by HHS.

Suggested Documentation

Jurisdictions must provide documentation of agreement by local law enforcement agencies to participate in POD operations at facilities that are included in the POD plan.

Remaining Issues and Options Related to the Standard

Although expert panel members agreed on the need for a law enforcement presence at PODs, they also agreed that achieving adequate participation of law enforcement could be infeasible for some communities. In particular, in some rural communities, the police department may consist of only a handful of sworn officers. If such a community needed to establish multiple PODs to minimize travel distances, it may not be possible to staff each POD with a sworn officer full time.

Even in jurisdictions with larger police departments, officers may be drawn away by their department commanders for more pressing duties. Health departments thus raised concerns that a standard might include requirements that are out of health departments' control.

Even in such situations, both of the alternative standards are written so that they provide communities with flexibility to incorporate cooperative agreements with nearby larger cities or with state or county law enforcement agencies if doing so provides required resources. However, *a policy decision will be required regarding whether to explicitly allow for variances in this standard.*

SUMMARY AND CONCLUSION

The standards recommended in this chapter establish minimum requirements that communities should meet to ensure the success of prophylaxis dispensing efforts. The standards are purposefully not prescriptive about methods that communities should use to conduct security assessments and carry out security functions. This approach was adopted with the recognition that the SNS planning guidance addresses detailed guidance on these topics in detail and that it is necessary to provide flexibility to allow communities to design security planning and practices that best fit with their own organizations' operations and interagency agreements.

Despite this attempt to incorporate flexibility into the security standards, review of the standards by CRI sites revealed several areas in which policy decisions will be required. As evident in Standards 4.2 and 4.3, these policy judgments relate to what types of responsibilities public health departments will be held accountable for and whether variances will be incorporated into implementation to account for resource constraints in rural communities.

7. NEXT STEPS

This report presented recommended minimal infrastructure standards for PODs. The standards focus on the number and locations of PODs, internal POD operations, POD staffing, and POD security. This concluding chapter briefly summarizes key features of the recommended standards and offers next steps.

An overriding consideration that resulted from analysis and consultation with the expert panel and other stakeholders was that many different infrastructure configurations can lead to the same operational output. The expert panel counseled strongly against inflexible numerical thresholds and argued in favor of standards that provide appropriate flexibility and responsiveness to state and local needs.

Thus, rather than providing precise and inflexible targets, the standards generally seek to ensure that POD planning and infrastructure elements are internally consistent and well aligned with the community context. The standards fall into four categories:

- **Analytic standards:** Most of the proposed standards require some sort of auditable analysis as a basis for site-specific POD planning decisions.
- **Process standards:** Other proposed standards require that CRI sites engage in specific and auditable planning processes that do not necessarily involve analysis.
- **Consistency standards:** One proposed standard seeks to promote internal consistency via a quantitative algorithm about the relationship among elements of POD infrastructure.
- **Specific requirements for POD plan:** A few of the proposed standards require specific planning elements, such as the number of law enforcement officers per POD.

RECOMMENDED NEXT STEPS

The remainder of this chapter recommends next steps for decisionmakers in finalizing and implementing POD standards.

Review the Recommended Standards and Consider Enactment

First and foremost, relevant HHS officials and other authorities must review the recommended standards, consider whether changes need to be made, and take steps to enact them.

In considering the recommended standards, we encourage decisionmakers to review not just the standards themselves but also the discussion of the process used to develop them and the analytical and logical basis behind them. In this report, we sought to provide a useful decisionmaking tool. Thus, decisionmakers are encouraged to consider whether the recommended standards reflect an appropriate weighing of the various trade-offs encountered by jurisdictions in developing POD plans.

As noted earlier, the standards are based on available empirical evidence, computer models, and the experience and consensus of expert practitioners. But given the weaknesses in existing evidence and tools

and the occasional difficulty in developing expert consensus, the report offers alternate versions of some standards. In these instances, policymakers must use their judgment in selecting among the alternatives.

Determine Whether Recommended Standards Apply Beyond CRI Awardees

A commonly discussed issue during the stakeholder review of the recommended standards was whether the standards will apply only to CRI-funded jurisdictions or to all jurisdictions involved in the SNS program (which effectively includes all jurisdictions). The SNS program shares the 48-hour goal, which would argue for universal application of the standards. On the other hand, as noted in this report, it appears likely that the relative compliance burdens of the standards would be considerably higher for small jurisdictions. One option is to initially restrict the standards to CRI awardees, evaluate their effectiveness and feasibility, and, as appropriate, roll them out more broadly.

Similarly, a common theme in stakeholder discussions about the recommended standards revolved around whether some of the standards would hold public health agencies accountable for factors under the control of other agencies (e.g., security). We recommend that HHS develop and publicize a clear statement of intent on this issue to accompany the standards.

Ensure Alignment with Other Standards, Guidelines, and Technical Assistance

Standards are only one step to improving systems. Thus, the standards must be accompanied by systems for assessing compliance and providing technical assistance.

In drafting the recommended standards, we sought to ensure alignment with SNS program guidance, the TAR tool used to assess CRI and other SNS sites, and guidance from HHS. Given the volume of materials to consider, however, it is important for officials in HHS ASPR and CDC DSNS to review the standards for alignment across programs and with assessment tools and consider strategies for simplification.

A common question raised during the stakeholder review process was how the standards would relate to the TAR tool. One option to consider is that the standards could represent the capacities for which awardees are held accountable and which, under the PAHPA legislation, might include the withholding of funds. Thus, TAR items that are covered in standards would result in the financial consequences enumerated by PAHPA while other items would be for improvement purposes only and would carry no such consequences.

Another issue related to assessments involves how POD time data will be used as evidence of compliance with Standard 2.2, which requires a combination of time data and computer models to estimate POD staffing requirements. Despite CDC DSNS's efforts to provide technical assistance on time-data collection, it still appears that there is considerable variability in how these data are collected. This, in turn, would create problems in documenting compliance with this standard.

Clarify Consequences Attached to Recommended Standards

Finally, a common concern raised during the stakeholder review process related to exactly what consequences would be attached to compliance with POD standards. Specifically, it might be necessary to develop an algorithm for rolling up indicators of compliance across the standards into a single evaluative scale, similar to the weight-and-sum methods used in the TAR tool. Similar explicit decisions should be made about the extent to which jurisdictions' performance on standards is to be publicized, thus introducing the possibility of political and public opinion consequences.

Develop a Process for Routinely Reviewing and Updating Standards

It should be noted that our process of developing recommended standards did not follow the path for standards setting bodies articulated by the American National Standards Institute (ANSI, 2007, 2008), the National Fire Protection Association, or other well-known standard-setting organizations. Given the timeline and scope of this project, we were unable to incorporate all components of the formal process of standards development and review. However, we suggest that HHS develop a process — perhaps by means of an existing external oversight committee — to regularly review these standards, using a process that engages stakeholders in an equitable and responsive environment, invites comment from the public, and allows for right of appeal. Such a committee could also undertake future standards development activities, employing outside organizations and experts for technical analysis but taking the lead in convening and managing the process.

As much as possible, the standards review process should be informed by emerging evidence. Thus, HHS should develop processes that encourage the collection, analysis, and dissemination of data and lessons learned from exercises and from real events. Such evidence might help assess whether compliance with the recommended standards predicts adequate levels of operational capabilities, as demonstrated through exercises and responses to smaller-scale, real events. Emerging evidence might also point to areas where some infrastructure configurations work better than others and where the proposed standards might be revised to be more specific and prescriptive than they currently are.

Initiate Process for Developing Additional Infrastructure Standards and Standards for Operational Capabilities

As noted in Chapter One, the set recommended infrastructure standards presented in this report are not intended to be a complete set. Thus, even full compliance with the standards might leave jurisdictions quite vulnerable to deficiencies in incident management, tactical communication, public information/communication, and so on. Thus, HHS should also consider developing standards in these areas.

In addition, and as noted in Chapter One, the recommended POD infrastructure standards were originally intended as a prelude to the development of standards for operational capabilities. Thus, while the standards presented here focus on numbers of staff and facilities, planning processes, and related

functions, additional standards are needed to ensure that jurisdictions can translate infrastructure capacities into operational capabilities, such as the ability to produce adequate POD throughputs or mobilize staff in a timely manner.

Standards that focus on operational capabilities might help get around the difficulties in developing standards — encountered frequently in this report — raised by the fact that often many different infrastructure configurations can lead to the same level of operational capability. Thus, jurisdictions could be held accountable for demonstrating a certain level of operational capability and then allowed to use whatever infrastructure configurations can achieve those goals effectively, efficiently, and reliably.

In developing operational capability standards, it is desirable to supplement scientific analysis with an expert panel review process. As with these recommended infrastructure standards, the primary task is to determine what “upstream” capabilities (e.g., throughputs) are required to ensure that jurisdictions can meet the overall goal of 48-hour full-community prophylaxis. Unfortunately, the evidence base linking individual POD performance to the ability of a full system of PODs to meet the CRI goal is thin, and the standards will necessarily need to allow for flexibility to permit creativity in implementation. To supplement the existing thin evidence base, it would be possible to make more systematic use of time data from POD exercises to explore large-scale system dynamics through mathematical simulations.

While providing a detailed research design is beyond the scope of this report, the process for developing operational capability standards could build upon the process used to develop the infrastructure standards. It might also be desirable to integrate the process of developing new standards with the process of reviewing and updating standards, as described earlier. Doing so would allow for engagement of a broader range of stakeholders and formal endorsement of the standards by relevant stakeholder organizations.

CONCLUSION

Defining acceptable levels of readiness to respond to public health emergencies remains an important and difficult challenge. The recommended standards presented in this report provide a set of specific and operationalizable targets that could be used to gauge readiness to provide antibiotics and other countermeasures to communities within a short period of time. The recommended standards can also help facilitate comparisons across sites and spark learning and improvements in preparedness planning.

A. INSTRUMENT FOR DATA COLLECTION FROM CRI SITES

The U.S. Department of Health and Human Services Office of the Assistant Secretary for Preparedness and Response (HHS ASPR) asked RAND to lead a process to develop minimal infrastructure standards for PODs at CRI sites. The process is being conducted in close collaboration with the Centers for Disease Control and Prevention Division of the Strategic National Stockpile (CDC DSNS) and HHS ASPR. This tool is designed to gather data on CRI sites that will help ensure that the standards development process is guided by a clear picture of current practice in the original 21 CRI sites. An appendix with key terms and definitions has been provided for clarification.

You may either type your answers on this form or write them in a separate document. You need not attach other documents or other extended descriptions. Our goal is to use this form to gather summary information. Later, we might wish to contact selected CRI sites to gather more detailed information.

Please fill out a separate form for each of the **original** CRI sites in your region and return it by Friday **February 23**. Please send the forms to Leah Barnes Caldarone (RAND) at lbarnes@rand.org or

RAND Corporation

P.O. Box 2138

1776 Main Street

Santa Monica, CA 90407-2138

Phone: (310) 393-0411 x6872

NAME OF CRI SITE: _____

For each jurisdiction, please complete the following information:

1. How many PODs are in the local jurisdiction's dispensing plan for addressing the need to prophylax the entire metropolitan region within 48 hours (per the CRI standard)?
2. How many sites meet the POD criteria in CDC's Version 10.02 guidance?
3. Which types of facilities did the jurisdiction consider as possible POD locations? (Check all that apply.)
 - a. Public schools
 - b. Universities
 - c. Community recreation centers
 - d. Firehouses
 - e. Polling places
 - f. Armories or National Guard buildings
 - g. Other _____
4. Please answer the following questions about how the jurisdiction determined the number and locations of PODs.
 - a. Please describe any distance criteria that the jurisdiction has applied in selecting POD locations. Were there goals in terms of the maximum distance that someone would need to travel in order to reach their nearest POD location? Does this distance vary depending on whether one lives in an urban or rural environment?
 - b. Describe any other transportation considerations were considered (e.g., location of transit stops).
 - c. Were population densities considered in selecting the locations of PODs? For example, did the jurisdiction space them evenly throughout the area to be served, or did they put more PODs in densely populated areas and fewer PODs in more sparsely populated areas? Was there a limit on the population to be assigned to each POD?
 - d. Please describe other considerations that were taken into account.
5. Are some PODs expected to be more heavily utilized than others?

- a. If so, what is the expected hourly throughput at the largest POD?
 - b. What is the expected hourly throughput at the smallest POD?
6. How does the jurisdiction's plan direct people to the PODs? (Choose one, a or b, below; if neither choice is accurate, describe plan's directions below.)
 - a. Does it assign households to different POD locations? If so, how?
 - b. Does it assume that people will simply travel to their nearest POD?
7. Does the plan allow for individuals to pick up multiple regimens (e.g., head of household can pick up regimens for family members)?
 - a. If so, what percentage of the population is expected to pick up multiple regimens?
 - b. How many multiple regimens, on average, are they expected to pick up (e.g., a parent might pick up 5 dosages total for 3 children, 1 spouse, and himself/herself)?
 - c. Is there a maximum limit to the number of regimens dispensed to the head of household? If so, what is the maximum number of regimens?
8. Briefly describe how the public will be informed about the location of PODs (and the possible assignment of different households to different PODs, if relevant).
9. Please attach a list of the POD locations that the jurisdiction has selected (street address, city, zip code).
10. Are there tiers or ways of classifying levels of public health emergency that affect POD designs and/or dispensing plans?
 - a. Do these tiers lead to suspension of regulations, such as a change in who is permitted to perform certain functions (such as dispensing) at the PODs? Please explain.
 - b. Do these tiers lead to elimination or shortening of certain steps performed at the PODs? Please explain.
 - c. What are the criteria (e.g., trigger points) for these tiers?
11. Do the dispensing plans distinguish "express" from "non-express" dispensing?

- a. If so, what percentages of patients are expected to use each type of dispensing?
 - b. Are there differences in procedure or in the skill level of the staff who will serve each category of patient?
12. Briefly describe plans for pre-event training for POD staff/volunteers.
13. Briefly describe plans for just-in-time training (e.g., job action sheets) for POD staff/volunteers.
14. According to CRI site planning, what percentage of the overall population would not be able to travel to a POD to receive prophylaxis?
15. Briefly describe any plans for dispensing prophylaxis to populations that cannot come to the POD (e.g., homebound populations). Has the jurisdiction exercised this model?
16. Are there plans for early dispensing of prophylaxis to emergency response staff? If so, please specify whether this is done using assets reserved for response staff prior to the arrival of DSNS assets OR with SNS-provided assets before dispensing to the general public.
 - a. Does the plan call for providing responders with prophylaxis for their families? Please describe.
 - b. Has the jurisdiction exercised this model?
17. Is there anything distinctive about this jurisdiction's plan that is not covered here?

18. Please complete the data table below for the jurisdiction’s **standard “medical model” POD operations design**.

- a. Has the jurisdiction conducted a time study of this design?
- b. In the jurisdiction’s last exercise of this standard design, what is the average amount of time that a patient spent at the POD, from start to finish?

POD Operations Step ⁴²	Does the Standard design include this step? (Y/N)	Please mark the skill level(s) allowed to perform each step. (May mark multiple boxes.)							Estimated Time per Step ⁴³ (minutes/patient)
		MD	RN	Pharmacist	EMT	Medical/ Nursing Student	Other Medical Worker	Unskilled Volunteer	
Greeting									
Form Distribution									
Triage									
Medical Evaluation									
Mental Health Evaluation									
Briefing									
Drug Triage									
Dispensing — oral antibiotics									
Dispensing — injections									
Form Collection and Exit									

⁴² See the survey’s appendix for definitions of POD operation steps from Hupert et al. (2004).

⁴³ If the jurisdiction has conducted a time study based on this standard POD design, please provide the results here. Lacking those, if the jurisdiction has not completed a time study but has plan-based estimates for the average duration of each step (per person), please provide the estimated figures here.

19. Is there a **streamlined POD operations design**? This would be a POD design that includes fewer steps/services/staff or shorter patient processing times than the standard “medical model” POD design described in question 18. If so, please fill out the data table below and provide a short description of how the design differs from the standard model:

- a. Has the jurisdiction conducted a time study of this design? In the jurisdiction’s last exercise of this alternative design, what is the average amount of time that a patient spent at the POD, from start to finish?
- b. Please indicate which steps are included in the model.

POD Operations Step	Does the design include this step? (Y/N)	Please mark the skill level(s) allowed to perform each step. (May mark multiple boxes.)							Estimated Time per Step ⁴⁴ (minutes/patient)
		MD	RN	Pharmacist	EMT	Medical/ Nursing Student	Other Medical Worker	Unskilled Volunteer	
Greeting									
Form Distribution									
Triage									
Medical Evaluation									
Mental Health Evaluation									
Briefing									
Drug Triage									
Dispensing — oral antibiotics									
Dispensing — injections									
Form Collection and Exit									

20. Please describe any procedures, regulations, or policies that govern decisions about who can authorize when a different POD design can be used.

⁴⁴ If the jurisdiction has conducted a time study based on this alternative POD design, please provide the results here. Lacking those, if the jurisdiction has not completed a time study but has plan-based estimates for the average duration of each step (per person), please provide the estimated figures here.

21. Please complete the data table below with information about the **number of staff** that the jurisdiction needs and that it has recruited.

a. What tools did the jurisdiction use to estimate its staffing needs?

Total Staff Needed						Staff Recruited	
MD	RN	Pharmacist	EMT	Medical/ Nursing Student	Unskilled Volunteer	Total no. of staff recruited (on call- down list)	No. of staff trained in advance?

22. Please complete the data table below for the jurisdiction's security operations.

Security Capability	Does the security plan include this capability? (Y/N)	Please mark which type(s) of personnel will be used to provide each capability. (May mark multiple boxes.)		
		Uniformed law enforcement	Professional/ facility security	Volunteer
Public security/ law enforcement				
Access control				
Vehicle traffic control				
Internal crowd control				
External crowd control				
Parking				

23. What percentage of sworn officers making up the jurisdiction's total security police force will be dedicated to providing security at PODs during an emergency event? (Please mark one box below.)

<10%	10–25%	25–50%	>50%

Appendix: POD Operations Steps⁴⁵

Greeting: Greeters have the dual role of directing people into the DVC and also screening the crowd (visually and/or via direct questions) for obviously ill patients who require immediate medical evaluation or individuals at higher risk for exposure (i.e., if time and location of exposure are known).

Form distribution: Most plans will include some type of data collection using forms filled out by patients. These forms serve multiple purposes, including guiding triage (e.g., by asking all those who checked a certain box or set of boxes to proceed to medical or mental health evaluation) and facilitating follow-up (e.g., by asking for contact information).

Triage: Triage involves using patient-completed forms or protocol-based questions to identify people requiring medical evaluation and/or, depending on design, mental health evaluation. People who screen negative at triage can proceed directly to the dispensing station. Since it is protocol driven, triage does not necessarily need to be performed by health care professionals.

Medical evaluation (symptomatic individuals): Acutely symptomatic individuals or those who have symptoms suggestive of illness due to the attack may require evaluation by health care professionals, preferably staff who are experienced in evaluation and stabilization of sick patients (e.g., paramedics, emergency department nurses, physicians). Depending on time, resource availability, and linkages to health care facilities, medical treatment may include initiation of antibiotics and other interventions prior to transport for seriously ill patients.

Briefing: Briefings may improve compliance with medical regimens, decrease mental stress due to the event, and in some cases may be required by regulation. Additionally, briefings may provide information about referrals to off-site counseling. Briefings should take advantage of the standardization and flexibility provided by pre-taped video/audio presentations, although these require additional resources and technical support (e.g., translation into multiple languages). The size and number of briefing rooms and the duration of briefings may limit the maximum rate of patient flow.

⁴⁵Hupert et al. (2004).

Drug triage (pharmacotherapeutic evaluation): The purpose of drug triage is to rapidly identify people who require any drug regimen other than the standard drug type and dose (e.g., patients requiring a medication other than the adult dose doxycycline for anthrax prophylaxis). Drug triage questions may be part of the written information form filled out at POD entry or asked of patients arriving in the dispensing area. Families with children may be identified at drug triage for further assistance to determine pediatric dosages.

Dispensing or vaccination (express versus assisted): Patients may be directed to a single dispensing station that has staff available for pharmacotherapeutic consultation or, alternatively, to one of two dispensing areas designed to handle uncomplicated (“express”) or complicated (“assisted”) dispensing cases. Large PODs with sufficient staff may achieve greater efficiency by establishing a separate dispensing line for people whose drug triage evaluation suggests the need for dose modification or an alternative drug. Assistance may include determining the correct type and dose of antibiotics for adults with reduced kidney function or medication allergies or for children based on age, weight, or height, as well as for those with a history of allergic reactions. Communities may opt to allow one person (e.g., the head of a household, the spouse or friend of someone who has a mobility impairment) to pick up medications for persons other than themselves; these cases may take additional time and should be directed to the “assisted” dispensing area.

Form collection and exit: Although patient information forms may have been used for triage, exit staff may still be needed to check the accuracy of contact information as patients leave. Additionally, exit staff may be able to provide details regarding follow-up care, reinforce compliance messages, and even perform “spot checks” for quality assurance (e.g., checking whether patients are receiving the correct medications).

B. LIST OF PANELISTS

MEMBERS

Erik Auf der Heide, M.D., M.P.H., FACEP

Agency for Toxic Substances and Disease Registry
Centers for Disease Control and Prevention

Douglas J. Ball, M.D.

Medical Director, Bureau of Emergency Management
New York City Department of Health and Mental Hygiene

Jeff Blystone

Assistant Bureau Director, Bureau of Community Health Systems
Pennsylvania Department of Health
(Formerly Pennsylvania Strategic National Stockpile Coordinator)

Jody Chattin, M.P.H.

Metropolitan Medical Response System Coordinator
Office of Emergency Management and Communications
Chicago, Illinois

Ken Kunchick

Senior Inspector
Office of Emergency Management
U.S. Marshals Service

Gene Matthews, J.D.

Senior Fellow
North Carolina Institute for Public Health
University of North Carolina

Matthew Minson, M.D.

Office of Preparedness and Response
State of Maryland Department of Health
(Now at the U.S. Department of Health and Human Services)

Matthew Sharpe

Emergency Response and Exercise Coordinator
Tulsa Health Department

Glen Tao, Pharm.D.

Strategic National Stockpile Coordinator
Emergency Preparedness and Response Program
Los Angeles County Department of Public Health

Ruth Thornburg, M.A., M.S.

Public Information and Communication Specialist
Program Preparedness Branch
Centers for Disease Control and Prevention, Coordination Office for Terrorism Preparedness and
Emergency Response, Division of Strategic National Stockpile

John H.H. Turner III

Director
BENS Georgia Business Force
(Now at the Centers for Disease Control and Prevention)

George Whitney

Director
Multnomah County, Oregon, Emergency Management

Kathy Wood

Public Health Emergency Preparedness and Response Program
Montgomery County, Maryland, Department of Health and Human Services

MEMBERS EX OFFICIO

Stephanie Dulin

Chief, Centers for Disease Control and Prevention, Coordination Office for Terrorism Preparedness and Emergency Response, Division of Strategic National Stockpile, Program Preparedness Branch

Patricia Pettis, M.S., ARNP

Commander, U.S. Public Health Service

Regional Emergency Coordinator

Office of the Assistant Secretary for Preparedness and Response, U.S. Department of Health and Human Services

(Formerly Cities Readiness Initiative Coordinator, Centers for Disease Control and Prevention, Coordination Office for Terrorism Preparedness and Emergency Response, Division of Strategic National Stockpile, Program Preparedness Branch)

C. LOCATION MODELING AND ANALYSIS

To guide standards on the location of PODs, we constructed mathematical models that analyze the dependencies and trade-offs involved in selecting locations. Because standards would need to apply to a full range of communities, we conducted this analysis using data from a set of CRI sites that represented considerable variation in size, area, and population density.

The location analysis work produced two considerations for the development of standards:

- Travel distance to PODs depends on geography and population density. Standards that call for a mandatory distance limit may thus be easily achievable in densely populated cities but impossible to meet in less dense areas.
- POD location plans must take into account variations in population density *within* the jurisdiction. Specifically, there is an inherent trade-off between the two goals: Mandating a standard that favors shorter travel distances would often force a jurisdiction into accepting different-sized PODs and vice versa.

This appendix describes in more detail the modeling and analysis that was performed.

TRAVEL DISTANCE TO PODS DEPENDS ON GEOGRAPHY AND POPULATION DENSITY

One goal of the mass prophylaxis plan should be to ensure that PODs are capable of providing prophylaxis to an entire population within the desired time frame in an *equitable* manner so that all the people in the jurisdiction, regardless of demographics or location, have access to PODs. To provide a surrogate measure of accessibility, we analyzed travel distance to the nearest POD via the road network.⁴⁶

Just as determining the appropriate number of PODs depends on a variety of factors (see Chapter Three), travel distance to the nearest POD is also related to several other variables. These include

- number of PODs
- specific POD locations
- size of the service area
- density and spatial distribution of the population.

We developed a location optimization model designed to select, for a given number of PODs, a set of POD locations that would *minimize worst-case* travel distances⁴⁷ to the nearest POD across the entire

⁴⁶ Clearly, other elements influence access, such mode and speed of travel (i.e., traveling 20 miles in a car on an open road is clearly different from walking 20 miles). Distance, however, provides a readily measurable proxy for POD location and access.

⁴⁷ Specifically, the model minimizes the worst-case travel distance as a primary objective and then minimizes the average travel distance as a secondary objective. The worst-case distance relates to the goal

service area, ensuring that no one will have to travel too far to receive prophylaxis. In addition to producing the set of POD locations, the model also calculates the average travel distances to the PODs. By running the model for varying numbers of PODs, we can produce curves that show the relationship between the number of PODs and the average travel distance needed for the population to get to their nearest PODs.

We performed this analysis for three MSAs with different population sizes, areas, and population densities: San Francisco, Atlanta, and Pittsburgh. Demographic information from these CRI sites is provided in Table C.1.⁴⁸

Table C.1: Demographic Characteristics of Three Sample CRI Sites

Demographic Characteristic	<u>High Density</u>	<u>Medium Density</u>	<u>Low Density</u>
	San Francisco	Atlanta	Pittsburgh
Population	776,733	1,481,871	3,008,921
Area (sq. miles)	46	796	9,474
Pop. density	16,886	1,862	318

The results of this analysis are shown in Figure C.1. The vertical axis corresponds to the number of PODs, and the horizontal axis shows the average distance that residents must travel to reach their nearest POD. The three curves in the figure illustrate the results for the different scenarios examined for each of the three test-case MSAs.

As expected, reducing the average travel distance requires adding more PODs. This may provide a rationale for using more PODs with smaller average throughput levels. Note, however, the diminishing returns: Greater decreases in travel distance require a progressively higher number of PODs, as is evident in the increasing slope of the lines from right (higher travel distances) to left (shorter travel distances).

of equity, while the average travel distance relates to the overall efficiency of the location plan. In practice, there are often trade-offs between the worst-case and average travel distance goals. Preliminary modeling results suggested, however, that the worst-case travel distance could be significantly reduced with only a small corresponding increase in average travel distances.

⁴⁸ The demographic data shown are for MSAs in each CRI site. For Pittsburgh, the CRI region covers 13 counties, which accounts for its large population.

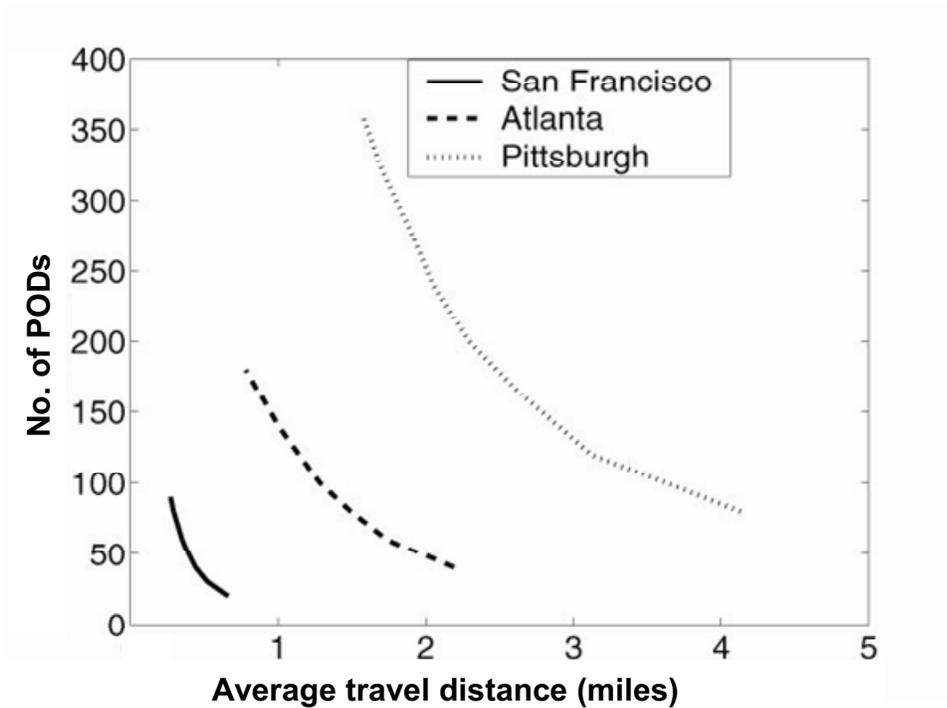


Figure C.1: Relationship Between Number of PODs and Average Travel Distances for Three MSAs

Furthermore, achieving smaller average travel distances is easier for MSAs with smaller geographic areas and higher population densities. For a given POD capacity (i.e., the number of people the POD can serve), a densely populated area will require more PODs than a sparsely populated area. Distributing more PODs over a smaller geographic area will result in smaller average distances for members of the public to travel to the nearest POD. Consequently, dense urban cores, with their higher concentration of PODs, will be able to offer shorter travel distances to PODs. Sparsely populated periphery areas, with fewer PODs, will require populations to endure longer travel distances. In contrast, in sparsely populated areas, attempts to ensure a short travel distance could require a prohibitively large number of PODs.

Standards that call for a mandatory distance limit may thus be easily achievable in densely populated MSAs but impossible to meet for less dense areas.

TRADE-OFF BETWEEN MINIMIZING TRAVEL DISTANCE AND SAME-SIZED PODS

In most places, population density varies considerably between the urban core and outlying areas. As a result, the actual number of individuals who come to each POD may vary widely from one POD to the next, causing large differences in the throughput required at each. If jurisdictions do not calculate the expected number of individuals who will visit each POD and adjust their staffing plans accordingly, then PODs in dense areas subject to above-average demand are likely to be overwhelmed during actual

operations, while PODs in sparse areas with lower-than-average demand may have more staff than needed. Jurisdictions should plan to open more PODs or increase staffing (and thus throughput) in densely populated areas accordingly.

Figure C.2 provides an example. Pictured is a map of two counties in the Atlanta area (DeKalb and Fulton), with higher population density shown in darker green. The left and right panels show two notional placements of 40 PODs generated by the location optimization model described previously.

Evenly spaced PODs result in wide variation in number served at each

More PODs placed in core areas result in more evenly sized PODs

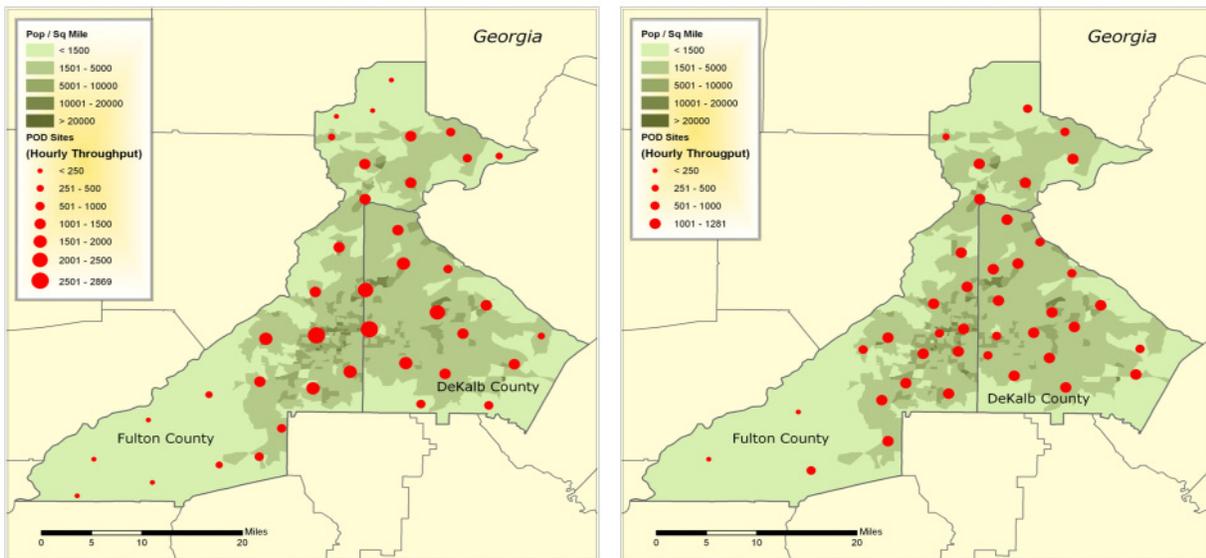


Figure C.2: Two Notional Placements of PODs in an MSA with Varying Population Density

In the left panel, PODs were placed primarily to *minimize the worst-case travel distance*,⁴⁹ resulting in a relatively *even spatial distribution*. The POD locations are denoted with red dots; the size of the dots is proportional to the throughput that would be necessary at the POD to handle the population that is likely to come to it, assuming that individuals go to their nearest PODs. PODs in densely populated areas in the MSA’s core would have to handle 10 times as many clients per hour as those in the less dense areas. Jurisdictions would have to design and staff the higher-volume PODs accordingly.

⁴⁹ Minimization of worst-case travel distances was the primary objective; minimization of average travel distances was the secondary objective.

Alternatively, to even out the size of the populations going to each POD, jurisdictions could set up more PODs in the denser areas, perhaps at the cost of having fewer PODs in sparse areas, as shown in the case on the right. The right panel in Figure C.2 shows the result of the same optimization model but with an added constraint on the throughput of each POD, thus limiting the size of the population that each POD would have to serve. The result is that PODs are more evenly sized, with more PODs in denser areas, but people living in sparsely populated areas would have to travel farther to reach a POD.

Each of the strategies shown in the figure is potentially feasible. However, there is an inherent trade-off between the two goals: Mandating a standard that favors shorter travel distances would often force a jurisdiction into accepting different-sized PODs. Instead of mandating one strategy, it may be more important to ensure that jurisdictions are aware of the geographic distribution of their population and the effect that this distribution would have on their placement and sizing of PODs in the mass prophylaxis plan.

D. MODELING AND ANALYSIS OF POD OPERATIONS AND STAFFING

To guide the development of standards on the internal operations and staffing of PODs, we used computer models to analyze the dependencies and trade-offs involved. Specifically, we used computer modeling to determine the effect of streamlining POD operations on the number of staff required to operate the POD and the resulting achievable throughput. This analysis informed expert panel discussions on the minimal set of operations and staffing that should be required at a POD during a CRI scenario.

Based on the review of practices at the original CRI sites (see Chapter Two) and a review of literature on PODs (see Hupert et al., 2004), we developed a *menu* of possible steps that might be included in the design of a POD, mindful that POD designs often combine these steps in different ways and give them different names and that not all POD designs use all of the steps. The menu of steps included the following:

- **Entry greeting and triage:** In addition to greeting people as they arrive, this step includes directing persons who have symptoms away from the POD and toward medical care at a treatment facility.
- **Briefing:** This step provides information about medical regimens and, in some cases, may be required by regulation. Briefings can also provide information about off-site counseling in addition to reducing mental stress caused by the event. The briefing is usually delivered in batch mode, with a group of persons attending together.
- **Form distribution:** This step involves the distribution of a form that will be used to determine whether the persons receiving prophylaxis have conditions that would require them to receive something other than the default medication. (People then fill out the form, but this does not require staff time.)
- **Form check and direct to Red/Yellow/Green lines:** This step involves the reading of a person's forms to determine, if applicable to the POD design, which line that person will enter: Green for those receiving the default medication, Yellow for families with children (who must receive a pediatric dose), and Red for persons with contraindications to the default drug.
- **Interview/screening in Red/Yellow/Green lines:** This step involves a more thorough questioning of the person receiving prophylaxis to determine an appropriate drug regimen and dose, following a protocol.
- **Dispensing in Red/Yellow/Green lines:** This is the physical act of handing medication to the person.

- **Exit and form collection:** This may involve the collection of each person's forms if that has not already been done. An informational pamphlet is also handed out. A final check that each person has everything they need before leaving may be carried out as well.

The notional POD flow diagram is shown in Figure D.1.

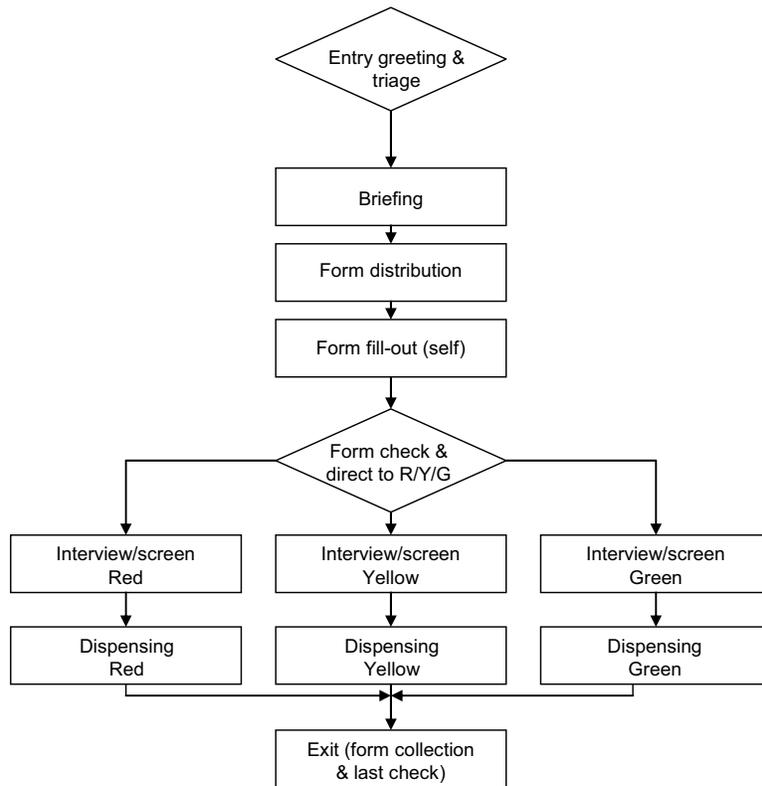


Figure D.1: Flow Diagram for Process Steps Within a Notional POD

We then specified six notional POD *design options*, which varied in the number of steps performed, the time spent on each step (processing time), and the level of medical training required. These six options were constructed based on conversations with medical experts at CDC and RAND, as well as data collected from CRI sites, all of which provided a basis for modeling, and informed discussions among members of the expert panel. These POD options range from a design that includes the complete set of previously described POD tasks, staffed primarily by medically trained professionals (Option 1), to a design that includes only a few of the POD tasks and uses no medically trained staff (Option 6).

- **Option 1: Medical-heavy POD.** The first option maintains a full complement of steps and relies considerably on medically trained staff. This includes a full briefing for clients on the disease and drugs (in a group presentation), greeting and triage at the entrance by

allied health professionals (such as EMTs, paramedics, or other medical assistants), interview and screening by nurses, and dispensing by pharmacists.

- **Option 2: Eliminate client briefing.** Same as Option 1, but with the briefing step eliminated (e.g., replaced with a handout).
- **Option 3: Reduce need for medical training.** Process steps same as Option 2 but allow nonmedical staff to conduct interview for Green (default-drug) clients. Medical staff would continue to conduct interviews for Red (contraindication to default drug) and Yellow (pediatric) clients. Nonmedical staff would be allowed to physically dispense drugs to all clients.
- **Option 4: Shorten interview.** Training levels would be the same as in Option 3 but with a shorter interview and screening process for Yellow and Red clients. The interview step would be entirely eliminated for Green clients.
- **Option 5: Further reduce medical level.** Process steps same as Option 4 but with reduction in training level so that all steps are performed by nonmedical staff.
- **Option 6: Eliminate forms and interview step.** All remaining steps are performed by nonmedical staff.

Table D.1 summarizes the six options by showing which steps are included and what level of training is required for each.

Computerized POD models require estimates of the processing time necessary for each POD step. The processing time for a POD step is the time required for a station to perform that step for each person. To analyze the impact of streamlining POD steps, we explored a range of potential processing times across the six options.

In Table D.2, we show the processing times in minutes for each step for each of the six options. The time estimates were based on collected exercise data submitted to RAND by CRI sites, time studies reported in published literature, and default values offered in various computer models. These six options and their processing times are *not* to be considered standards for POD designs or the time necessary to perform the given steps. Rather, these options are intended to be illustrative of the range of potential POD designs both in terms of POD tasks, staffing, and processing times.

Table D.1: Notional POD Designs

<i>POD Task</i>	<i>Staffing/Level-of-Care Options</i>					
	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
		<i>Eliminate Briefing</i>	<i>Reduce Medical Level</i>	<i>Shorten Process</i>	<i>Reduce Medical Level</i>	<i>Eliminate Steps</i>
Entry greeting and triage	Allied health	Allied health	Nonmedical	Nonmedical	Nonmedical	Nonmedical
Briefing	Nonmedical	--	--	--	--	--
Form distribution	Nonmedical	Nonmedical	Nonmedical	Nonmedical	Nonmedical	--
Form check and direct to R/Y/G	Nonmedical	Nonmedical	Nonmedical	Nonmedical	Nonmedical	--
Interview and screening (Red)	Nurse	Nurse	Nurse	Nurse	Nonmedical	--
Interview and screening (Yellow)	Nurse	Nurse	Nurse	Nurse	Nonmedical	--
Interview and screening (Green)	Nurse	Nurse	Nonmedical	--	--	--
Dispensing (Red)	Pharmacist	Pharmacist	Nonmedical	Nonmedical	Nonmedical	Nonmedical
Dispensing (Yellow)	Pharmacist	Pharmacist	Nonmedical	Nonmedical	Nonmedical	Nonmedical
Dispensing (Green)	Pharmacist	Pharmacist	Nonmedical	Nonmedical	Nonmedical	Nonmedical
Exit	Nonmedical	Nonmedical	Nonmedical	Nonmedical	Nonmedical	Nonmedical

Table D.2: Assumed Process Times, in Minutes, for Modeled POD Designs

<i>POD Task</i>	<i>Staffing/Level-of-Care Options</i>			
	Option 1	Options 2–3	Options 4–5	Option 6
		<i>Eliminate Briefing</i>	<i>Shorten Process</i>	<i>Eliminate Steps</i>
Entry greeting and triage	1	1	1	1
Briefing (in groups of 30)	15	--	--	--
Form distribution	0.25	0.25	0.25	--
Form check and direct to R/Y/G	0.5	0.5	0.5	--
Interview and screening (Red)	5	5	1.5	--
Interview and screening (Yellow)	5	5	2	--
Interview and screening (Green)	1	1	--	--
Dispensing (Red)	1	1	1	1
Dispensing (Yellow)	1	1	1	1
Dispensing (Green)	0.5	0.5	0.5	0.5
Exit	0.5	0.5	0.5	0.5

In addition to estimating processing times, we also had to estimate the percentage of the population arriving at a POD and qualifying for the Red, Yellow, and Green lines, respectively, as depicted in Figure D.1. The Yellow line represents pediatric clients, which we modeled as children under the age of 10. We obtained estimates using data from the 2005 Area Resource File Release (HHS, 2005) for the 21 CRI MSAs. The Red line represents people who are contraindicated for the default drug. Since a proper estimate of the percentage of people with contraindications would have been beyond the scope of this project, we instead used, for modeling purposes, the fraction of the population who are either pregnant women or age 65 and over. We approximated the percentage of pregnant women by using the statistics on the number of births per 100 people, again using the Area Resource File, for the 21 CRI MSAs. The range of the collected statistics is summarized in Table D.3. Based on these statistics, we modeled the percentage of people directed to the Red and Yellow lines as 10 percent each, with the remaining 80 percent of the population directed to the Green line.

Table D.3: Statistics Collected for the Percentage of the Population Using Red/Yellow/Green Lines

Line	Statistic	Range of Statistic (%)
Red	% of population age 65 and over	7.4 to 17.8
	Number of births per 100	1.1 to 1.9
Yellow	% of population under age 10	8.1 to 16.6

Finally, we generated staffing estimates for each of the six modeled POD design options using Clinic Planning Model Generator, version 1.25, developed by Herrmann and Treadwell (2006) at the University of Maryland. Other models are available⁵⁰ and could have been used; we chose Clinic Generator because it was freely available yet provided sufficient flexibility for users to input their own POD steps, client flow, and processing times. The output of the model was used to generate a graph showing staffing requirements at a fixed throughput for each of the POD designs (see Figure 5.1 in Chapter Five) and a graph showing the relationship between staffing requirements and throughput for each of the POD designs (see Figure 5.2).

⁵⁰ See for instance, BERM (Weill Medical College, Cornell University) (AHRQ, 2005) and RealOPT (Georgia Institute of Technology) (ISYE, 2006).

REFERENCES

- Aaby, Kay, Jeffrey W. Herrmann, Carol Jordan, Mark Treadwell, and Kathy Wood, "Improving Mass Vaccination Clinic Operations," Institute for Systems Research, University of Maryland, last updated November 22, 2004. As of January 15, 2008:
<http://www.isr.umd.edu/Labs/CIM/projects/clinic/ichss2005.html>
- Agency for Healthcare Research and Quality, "Computer Staffing Model for Bioterrorism Response: Version 2.0 BERM," current as of September 2005. As of November 19, 2007:
<http://www.ahrq.gov/research/biomodel.htm>
- Agency for Healthcare Research and Quality, *Altered Standards of Care in Mass Casualty Events*, AHRQ Publication No. 05-0043, April 2005.
- AHRQ—*see* Agency for Healthcare Research and Quality.
- American National Standards Institute, *Overview of the U.S. Standardization System: Voluntary Consensus Standards and Conformity Assessment Activities*, 2nd ed., 2007.
- American National Standards Institute, *Essential Requirements: Due Process Requirements for American National Standards*, January 2008.
- Annas G., W. Parmet, and W. Mariner, *Pandemic Preparedness: The Need for a Public Health — Not A Law Enforcement/National Security — Approach*, Washington, D.C.: American Civil Liberties Union, 2008.
- ANSI—*see* American National Standards Institute.
- Bush, George W., Homeland Security Presidential Directive 8: National Preparedness, December 17, 2003.
- Canada, B., *Homeland Security Standards for State and Local Preparedness*, Congressional Research Service, updated October 8, 2003.
- CDC—*see* Centers for Disease Control and Prevention.
- Center for Law and the Public's Health at Georgetown and Johns Hopkins Universities, *The Model State Emergency Health Powers Act*, draft, 2001. As of December 18, 2007:
<http://www.publichealthlaw.net/Resources/Modellaws.htm#MSEHPA>
- Centers for Disease Control and Prevention, *Mass Antibiotic Dispensing: Streamlining POD Design and Operations*, video, 2005a. As of April 30, 2008:
<http://www2.cdc.gov/phtn/webcast/antibiotic3/default.asp>
- Centers for Disease Control and Prevention, *Mass Antibiotic Dispensing: Using Public Information to Enhance POD Flow*, video, 2005b. As of January 11, 2008:
<http://www2.cdc.gov/phtn/webcast/antibiotic4/default.asp>

Centers for Disease Control and Prevention, *Mass Antibiotic Dispensing: Taking the Guesswork Out of POD Design*, video, 2007a. As of December 18, 2007:
<http://www2.cdc.gov/phtn/webcast/poddesign/default.asp>

Centers for Disease Control and Prevention, *Receiving, Distributing, and Dispensing Strategic National Stockpile Assets: A Guide for Preparedness*, Version 10.02, 2007b.

Centers for Disease Control and Prevention, *Technical Assistance Review Tool*, 2008.

DHS—see U.S. Department of Homeland Security.

Enright, Paul L., and Duane L. Sherrill, “Reference Equations for the Six-Minute Walk in Healthy Adults,” *American Journal of Respiratory and Critical Care Medicine*, Vol. 158, No. 5, November 1998, pp. 1384–1387.

Gostin, Lawrence O., Jason W. Sapsin, Stephen P. Teret, et al., “The Model State Emergency Health Powers Act: Planning for and Response to Bioterrorism and Naturally Occurring Infectious Diseases,” *Journal of American Medical Association*, Vol. 288, No. 5, 2002, pp. 622–628.

Herrmann, Jeffrey W., and Mark Treadwell, *Clinic Planning Model Generator*, Version 1.25, Institute for Systems Research, University of Maryland, 2006. Funded by CDC Cooperative Agreement Number U50/CCU302718. Latest version, as of December 19, 2007:
<http://www.isr.umd.edu/Labs/CIM/projects/clinic/>

HHS—see U.S. Department of Health and Human Services.

Hodge, James G., Jr., Raymond P. Pepe, and William H. Henning, “Voluntarism in the Wake of Hurricane Katrina: The Uniform Emergency Volunteer Health Practitioners Act,” *Disaster Medicine and Public Health Preparedness*, Vol. 1, No. 1, 2007.

Hupert, Nathaniel, Jason Cuomo, Mark A. Callahan, Alvin I. Mushlin, and Stephen S. Morse, *Community-Based Mass Prophylaxis: A Planning Guide for Public Health Preparedness*, AHRQ Publication No. 04-0044, Rockville, Md.: Agency for Healthcare Research and Quality, August 2004.

Industrial and Systems Engineering, Georgia Institute of Technology, “Center for Operations Research in Medicine and HealthCare,” last updated May 2006. As of November 19, 2007:
<http://www2.isye.gatech.edu/~evakylee/medicalor/research.htm>

Institute for Systems Research, University of Maryland, “Improving Mass Vaccination Clinic Operations,” last updated January 11, 2008. As of November 19, 2007:
<http://www.isr.umd.edu/Labs/CIM/projects/clinic/>

ISR—see Institute for Systems Research.

ISYE—see Industrial and Systems Engineering.

Mello, Michelle M., and Troyen A. Brennan, “Legal Concerns and the Influenza Vaccine Shortage,” *Journal of the American Medical Association*, Vol. 294, No. 14, 2005, pp. 1817–1820.

Neustadt, Richard E., and Harvey V. Fineberg, *The Epidemic That Never Was: Policy-Making and the Swine Flu Scare*, New York: Vintage Books, 1983.

Public Law 109-417, Public Health Preparedness Act of 2006, December 19, 2006.

Spitzer, James D., Nathaniel Hupert, Jonathan Duckart, and Wei Xiong, "Operational Evaluation of High-Throughput Community-Based Mass Prophylaxis Using Just-in-Time Training," *Public Health Reports*, Vol. 122, No. 5, 2007, pp. 584–591.

Turnock, Bernard J., and Christopher Atchison, "Governmental Public Health in the United States: The Implications of Federalism," *Health Affairs*, Vol. 21, No. 6, 2002, pp. 68-78.

U.S. Department of Health and Human Services, Public Health Service, Health Resources and Services Administration, ODAM Area Resource File, 2005.

U.S. Department of Homeland Security, *Interim National Preparedness Goal*, Washington, D.C., March 31, 2005.

U.S. Department of Homeland Security, *Target Capabilities List*, September 2007.

Wasserman, Jeffrey, Peter D. Jacobson, Nicole Lurie, Christopher Nelson, Karen Ricci, Molly Shea, James L. Zazzali, and Martha I. Nelson, *Organizing State and Local Health Departments for Public Health Preparedness*, Santa Monica, Calif.: RAND Corporation, TR-318-HHS, 2006. As of January 15, 2008:
http://www.rand.org/pubs/technical_reports/TR318/

Weill Medical College, Cornell University, "Bioterrorism and Epidemic Outbreak Response Model (BERM)," created by N. Hupert, J. Cuomo, and D. Wattson under HHS AHRQ Contract 290-00-0013, 2005. As of January 11, 2008:
<http://simfluenza.org>

Wein, Lawrence M., David L. Craft, and Edward H. Kaplan, "Emergency Response to an Anthrax Attack," *Proceedings of the National Academy of Sciences*, Vol. 100, No. 7, April 1, 2003, pp. 4346–4351.

Wilkening, Dean A., "Sverdlovsk Revisited: Modeling Human Inhalation Anthrax," *Proceedings of the National Academy of Sciences*, Vol. 103, No. 20, May 16, 2006, pp. 7589–7594. As of January 15, 2008:
<http://www.pnas.org/cgi/reprint/103/20/7589.pdf>