REPORT

Phase IV: National Physician Survey of STD Diagnosis, Treatment and Control Practices

Data Analysis and Dissemination Final Report

April 30, 2002

To:
Centers for Disease Control and Prevention
National Center for HIV, STD, TB
Prevention
Division of STD Prevention
Behavioral Intervention Research Branch
1600 Clifton Road
Atlanta, Georgia 30333

DATA ANALYSIS AND DISSEMINATION FINAL REPORT

Contract No. 200-96-0599

Task 18

PHASE IV: National Physician Survey of STD Diagnosis, Treatment and Control Practices: Survey Procedures and Physician Response

to

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Executive Summary

Title:	Phase IV: National Physician Survey of STD Diagnosis, Treatment and Control Practices: Data Analysis and Dissemination Final Report
CDC Contract Number:	200-96-0599, Task 18
Sponsor:	Behavioral Intervention Research Branch Division of STD Prevention National Center for HIV, STD, TB Prevention Centers for Disease Control and Prevention 1600 Clifton Road, Atlanta, Georgia 30333
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I. Statement of the Problem

(pp. 3-4) Partner notification, a technique for controlling the spread of sexually transmitted diseases (STDs) through the management of sexual partners, has been one of the key elements of a public health strategy to control sexually transmitted infections. There is very little knowledge about partner notification practices outside the public health setting despite the fact that most STD cases are seen in private health care settings. Therefore, the Centers for Disease Control and Prevention (CDC), National Center for HIV, STD, and TB Prevention, Division of Sexually Transmitted Disease Prevention, Behavioral Interventions Research Branch identified a need for national baseline information on current physician practices relating to STD diagnosis, treatment and control practices including partner management and notification.

II. Evaluative Objectives

(pp. 1-2) The STDcontact survey was designed collaboratively by Battelle and CDC researchers. The goal of the survey was to measure STD diagnosis, treatment and control practices among a nationally representative sample of physicians in 5 specialties that diagnose most STDs: obstetrics and gynecology, family and general practice, general internal medicine, pediatrics, and emergency medicine. In particular, the objective was to provide the baseline data necessary to characterize infection control practices, especially partner notification practices, for syphilis, gonorrhea, HIV, and chlamydia, and to measure the contextual factors that influence those practices. The survey data will help CDC to better focus STD control and partner notification program efforts and to allocate program resources.

III. Methodology

(pp. 4-6) Battelle and CDC collaborated in designing a 21-page survey instrument, survey materials, and the initial sampling plan. A pretest of the questionnaire informed the final instrument and sampling plan. Five medical specialties were selected for the survey based on evidence that they account for 85% of STDs diagnosed in the US and that the percentage of physicians from other specialties who treat STD is small (Hammett et al., 1997; DHHS, 1997). The sampling frame included all U.S. allopathic and osteopathic physicians in these specialties. The pool of eligible physicians was identified using the American Medical Association's Physician Master File (a comprehensive list of physicians in the United States and its territories). Therefore, every doctor fulfilling our inclusion criteria had an equal chance of being selected: the relative proportions of physician specialties in the survey matched those in the American Medical Association's Master File. Surveys were sent to a randomly selected sample of 7,300 physicians from the AMA's Physician Master File. The AMA Masterfile includes a listing of all physicians in all 50 states, and 15 territories. Physicians were selected from the 50 states, excluding the 15 territories. Inclusion criteria were physicians who reported that they:

- specialized in obstetrics/gynecology, general internal medicine, general practice or family practice, emergency medicine, or pediatrics;
- spent at least 50% of their professional time in direct patient care; and
- cared for patients between the ages of 13 and 60.

The data collection design was based upon Dillman's Total Design Method (1978), a methods study conducted as part of the formal pretest of the instrument (Kasprzyk, et al., 2001), a thorough review of physician survey methods research, a review of publications on physician surveys from a five year period, focus group data from physicians, and Battelle's experience surveying physicians. The survey design included the following:

- Delivery of the survey packet by Federal Express
- A cash incentive of $15
- Clear indication that the study was being conducted by the CDC
- A postage-paid return envelope.

A reminder postcard was mailed to all 7,300 sampled physicians approximately ten days after the initial mailing. Repeat packets, including surveys, were sent to all non-respondents approximately 4, 7, and 15 weeks after the initial mailing.

IV. Major Findings and Recommendations

(pp. 6-10) Completed surveys were received from 4,226 physicians. The cumulative response rate was 70.2% after adjusting for surveys that were undeliverable or returned as ineligible due to physician retirement, physic ians who cared only for patients under age 13 or over age 60, or those not in active practice. Geographically, respondents came from all 50 states and the District of Columbia, with regional distribution from the northeast (21%), south (32%), Midwest (25%), and west (22%).

The STDcontact survey data was used by CDC to:

- Describe and assess STD diagnosis experience, STD management and treatment practices, and STD partner management as well as notification practices for the overall sample and for subgroups by specialty, geographic location, and urbanicity.
- Identify differences between subgroups of physicians in STD diagnosis, management and treatment practices, and STD reporting and partner management practices. This information is essential to identify subgroups that CDC may work more closely with or allocate STD control program resources toward.
- Identify factors such as physician specialty, practice characteristics, and physician beliefs and attitudes that are associated with STD management, treatment, reporting and partner notification practices. This information is essential to identify factors that CDC may target through STD prevention programs.
- Summarize protocol, education, practices, and needs regarding STD control in a national sample of physicians. In addition, the survey data will be used for policy recommendations, additional research, and intervention planning and testing.

This project, Task 18, comprised the data analysis, manuscript preparation, dissemination and reporting phase of this research project. This report presents the activities and dissemination products within three main categories: Oral presentations of findings, Poster presentations of findings, and Manuscript preparation. Manuscripts and presentations disseminated under this task are included in the appendices.

Oral Presentation:

- In addition to presentations given by Dr. St. Lawrence at CDC and national meetings, Battelle investigators presented a symposium on methods to survey health care providers at the November 2000 American Public Health Association Meeting. The methods used in the STDcontact survey were presented in the third paper of this symposium.

Poster Presentations:

- Battelle investigators worked with Dr. St. Lawrence to prepare poster presentations. One was given at the International Society for Sexually Transmitted Diseases Research (ISSTDR) meeting in Denver, 1999. Four posters on findings concerning HIV questions were presented at the 13th International AIDS Conference in Durban, South Africa, 2000.

Manuscripts:

- Battelle investigators worked with Dr. St. Lawrence and other CDC staff to prepare five manuscripts on the STDcontact survey results. Three of these manuscripts are published or in press in peer reviewed journals. Two manuscripts are under editorial review. Two additional manuscripts are in preparation for submission to peer reviewed journals.

1.0 Introduction

The Centers for Disease Control and Prevention (CDC), National Center for HIV, STD, and TB Prevention, Division of Sexually Transmitted Disease Prevention, Behavioral Interventions Research Branch identified a need for national baseline information on current physician practices relating to STD diagnosis, treatment and control practices including partner management and notification. CDC was especially interested in information from the private medical sector. Therefore, the Centers for Disease Control and Prevention contracted with Battelle Centers for Public Health Research and Evaluation to conduct a national survey of 7,300 physicians who treat patients with STDs in a wide variety of clinical settings. Five specialty groups were surveyed: family practice, general internal medicine, obstetrician/gynecologists, pediatricians, and emergency room physicians. These specialties were selected because they diagnose the burden of sexually transmitted diseases in the United States.

The STDcontact survey data will be used by CDC to:

- Describe and assess STD diagnosis experience, STD management and treatment practices, and STD partner management as well as notification practices for the overall sample and for subgroups by specialty, geographic location, and urbanicity.
- Identify differences between subgroups of physicians in STD diagnosis, management and treatment practices, and STD reporting and partner management practices. This information is essential to identify subgroups that CDC may work more closely with or allocate STD control program resources toward.
- Identify factors such as physician specialty, practice characteristics, and physician beliefs and attitudes that are associated with STD management, treatment, reporting and partner notification practices. This information is essential to identify factors that CDC may target through STD prevention programs.

The survey data will be used by CDC to guide current and future STD control programs. Findings will help CDC to better focus STD control and partner notification program efforts and to allocate program resources. The survey provides key information to CDC as to how best to work with different groups of clinicians to improve STD prevention activities.

This report describes Battelle's work with CDC to analyze and disseminate findings from the STDCONTACT survey.

2.0 Background

Partner notification, a technique for controlling the spread of sexually transmitted diseases (STDs) through the management of sexual partners, has been one of the five key elements of a long-standing public health strategy to control sexually transmitted infections. Other elements include public education, screening, treatment, and prophylactic therapy. The purpose of partner management is to contain the spread of sexually transmitted diseases by tracing down the sexual contacts of infected individuals, informing them of potential STD exposure, and treating them if they are infected. Also known as partner notification, or contact tracing, this method has been widely used in the control of syphilis and has also been used to control gonorrhea, HIV and, most recently, chlamydia.

There are several different types of partner notification strategies, all of which are based on some form of confidential contact tracing. Strategies that demand active clinician involvement include *provider referral*, whereby providers elicit names of partners from index cases and then contact the potentially infected partners for follow-up; and *conditional or negotiated referral*, whereby providers inform patients that they are obligated to notify their partners and the patients are then expected to initiate contact with their partners. Providers actively follow up with both the index case and the potentially infected partners under both of these strategies. A third strategy, *patient referral*, is a more passive approach whereby clinicians discharge their partner management duties by informing patients that they should contact partners and refer them for clinical evaluation and testing; there is no further contact by the provider with either the index case or exposed partners. Additionally, the provider may inform the health department of the index case for the health department to conduct contact tracing. In public health settings (STD, public health and community clinics), partner notification and contact tracing is typically active in nature. It is generally carried out by the clinicians themselves or by health department personnel (disease investigation specialists) whose job it is to trace and contact partners of index cases, inform them of their potential exposures, and encourage them to seek treatment. There is very little knowledge about partner notification practices outside the public health setting despite the fact that most STD cases are seen in private health care settings.

No current descriptive data exist that allow the Centers for Disease Control and Prevention (CDC) to characterize partner notification practices among the broad range of clinical practice settings where STDs are diagnosed, including acute or urgent care, emergency room, or primary and ambulatory care clinics. The literature shows a large number of descriptive studies of partner notification in public health settings (Oxman, Scott, et al, 1994), particularly using the public health model of partner notification (Rasooly, Millson, et al, 1994). No current baseline data exist as to the practices among different physician specialties and groups, and across different practice settings, particularly characterizing partner notification practices across different STDs.

In addition, contextual factors such as community rates of STDs; types of STDs; legislative, policy, and clinic protocol obligations of clinicians; federal, state and local reporting requirements, are likely to impact the rate at which clinicians provide these services. Time constraints in practice settings, capitated vs. non-capitated patients, physician specialty and training, and public vs. private settings might also affect these services. Individual physician attitudes, beliefs and values, social norms, standards of practice, and other facilitators or barriers may affect clinician's behavior. None of these variables have been measured in a national sample survey to describe clinician practices in relation to sexually transmitted disease reporting, infection control and partner management.

The STDCONTACT survey was designed to provide the baseline data necessary to characterize infection control practices, especially partner notification practices, for syphilis, gonorrhea, HIV, and chlamydia, and the contextual factors that influence those practices. CDC and Battelle researchers collaborated in designing the 21-page survey instrument entitled STDCONTACT (Clinical Observation, Notification, Tracing and Control Techniques). Battelle designed the data collection materials and procedures, and conducted a pretest of the survey between August and October, 1998. Results of the pretest were used to finalize the survey instrument and the data collection procedures. After receiving OMB clearance in April, 1999, the national STDCONTACT survey was conducted between May and December, 1999.

Physicians in the specialties of obstetrics and gynecology, family and general practice, general internal medicine, pediatrics, and emergency medicine account for 85 percent of all STDs diagnosed (Hammett et al., 1997; National Health Care Survey, 1997). Therefore, the sampling frame for the survey included all U.S. allopathic and osteopathic physicians in these specialties who spend the majority of their professional time on direct patient care. Physicians in specialties such as dermatology, infectious disease, and urology/surgery see the remaining 15 percent of STD-infected patients. These specialties were excluded from the survey because the percentages of physicians in these specialties who treat patients with STDs are small, and they are likely to have had their STD patients referred by a primary care physician who is responsible for those patients' disease management.

Surveys were mailed to a randomly selected sample of 7,300 physicians from the American Medical Association's Physician Master File. The Physician Master File was used for the sampling frame since it includes all US medical school graduates, provides a more unbiased sample of physicians than the AMA Membership File, and is the most comprehensive national list of physicians. Inclusion criteria were physicians from all 50 states, who reported that they (1) specialized in obstetrics/gynecology, internal medicine, general or family practice, emergency medicine, or pediatrics; (2) spent at least 50% of their professional time in direct patient care; and (3) cared for patients between the ages of 13 and 60. In order to exclude internists who practice in a sub-specialty, general internists were only included if they did not specify a secondary specialty.

Each survey included a cash incentive of $15.00, a postage-paid return envelope, and was sent by Federal Express. A reminder postcard was mailed ten days later and repeat surveys were sent to non-respondents 4, 7, and 15 weeks after the initial mailing. The study was reviewed and approved by the Institutional Review Boards at CDC and Battelle and by the federal Office of Management and Budget (OMB). A letter enclosed with the survey explained that the return of a completed survey constituted consent for research participation.

The cumulative response rate was 70.2% after adjusting for surveys that were undeliverable or returned as ineligible. Completed surveys (N=4,226) were received from all 50 states and the District of Columbia, with approximately equal regional distribution (northeast - 21%, south - 32%, mid west - 25%, and west - 22%. Less than 9% of the original sample disqualified themselves because they did not see enough STDs in their practices. A more detailed description of the sampling rationale and data collection procedures was presented previously in the Phase III: National Physician Survey of STD Diagnosis, Treatment and Control Practices, Data Collection Final Report which was submitted to CDC on March 31, 2000.

3.0 Data Analysis and Dissemination Activities

In order to plan and carry out dissemination activities, we held three meetings with Dr. St. Lawrence and other staff from the DSTDP Behavioral Intervention Research Branch. Additionally we worked with Dr. St. Lawrence and her staff at other opportunities, including when we traveled to Atlanta for other meetings and when we attended conferences. Below we describe the activities and dissemination products within three main categories: Oral presentations of findings, Poster presentations of findings, and Manuscript preparation.

3.1 Oral Presentations

Dr. St. Lawrence has given oral presentations on the findings from this study in multiple meetings including at the CDC and at the National STD Conference in Milwaukee in 2000. In addition, Battelle investigators were invited to present a symposium on methods to survey health care providers at the November 2000 American Public Health Association Meeting. Below lists the APHA Symposium presentations. The methods used in the STDCONTACT survey were presented in the third paper of this symposium. A copy of the symposium slides is presented in Appendix A.

Kasprzyk D, Montaño DE, Phillips WR, Armstrong K.; Discussant, St. Lawrence J. System for Successfully Surveying Health Care Providers. Four papers showing methods research to increase response rates among clinicians:

1) System for Successfully Surveying Health Care Providers.
2) Getting Input: Conversations Among Physicians to Plan a Survey of Colorectal Cancer Screening
3) Applying Methods: A National Mailed Survey of STD Control Practices Among 7300 Physicians
4) Maximizing Response: Comprehensive Survey of Washington State Clinicians' Practices Regarding Assessing Risk for STDs or HIV

Presented at an invited symposium at the American Public Health Association meeting, November 2000, Boston, MA

3.2 Poster Presentations

We worked with Dr. St. Lawrence to develop presentations that were submitted to the International Society for Sexually Transmitted Diseases Research (ISSTDR) meeting and the 13th International AIDS Conference. All were accepted as poster presentations. We presented the poster on methods to maximize response rates, from the STDCONTACT pretest findings, at the ISSTDR meeting in Denver, 1999. We also prepared and presented four posters on findings concerning HIV questions from the STDCONTACT National Survey at the 13th International AIDS Conference in Durban, South Africa, 2000. Below lists the poster presentations. Handouts describing the poster presentations are attached in Appendix B.

Kasprzyk, D, Montaño, DE, and St. Lawrence, JS. Is It Possible to Get High Response Rates on a Survey of STD Practices From Busy Practicing Physicians? Presented at the International Society for Sexually Transmitted Diseases Research meeting, Denver, CO, July 1999.

St. Lawrence J, Kasprzyk D, Montaño DE, Phillips WR, Armstrong K. Infection control strategies by a national sample of United States primary care and emergency room physicians after diagnosis of HIV. Presented at the 13th International AIDS Conference, Durban, South Africa July, 2000.

Phillips WR, Armstrong K, St. Lawrence J, Kasprzyk D, Montaño DE. Referral patterns for HIV positive patients among a national sample of primary care and emergency room physicians in the United States. Presented at the 13th International AIDS Conference, Durban, South Africa July, 2000.

Kasprzyk D, Montaño DE, Phillips WR, Armstrong K, St. Lawrence J. HIV and AIDS public health reporting practices among a national sample of primary care and emergency room physicians in the United States. Presented at the 13th International AIDS Conference, Durban, South Africa July, 2000.

Montaño DE, Phillips WR, Armstrong K, St. Lawrence J, Kasprzyk D. Knowledge of HIV and AIDS public health reporting requirements among a national sample of primary care and emergency room physicians in the United States. Presented at the 13th International AIDS Conference, Durban, South Africa July, 2000.

3.3 Manuscript Preparation

We worked with Dr. St. Lawrence and her staff to conceive, conduct analysis and write several manuscripts for publication in peer-reviewed journals. The first manuscript, published in Evaluation and the Health Professions, presented findings from the pretest concerned with methods to maximize physician survey response. A second manuscript presents overall survey findings on STD screening, testing, reporting, management and partner notification by physicians. This paper is meant to provide overall findings on a wide range of the survey measures, and to provide a complete description of the survey methods so that subsequent papers will refer to it. The paper is in press in the *American Journal of Public Health*.

We formed a Publication Committee consisting of Dr. St. Lawrence, Dr. Kasprzyk, and Dr. Montaño, to review and approve manuscript ideas proposed by individuals. We provided review and comments to Dr. Crosby on a manuscript concerned with rural vs. non-rural comparison of STD diagnosis. This paper is in press in *The Health Education Monograph Series*. We also worked closely with Drs. Hogben and St. Lawrence on two manuscripts. One is concerned with STD screening practices by obstetricians and gynecologists, and is under editorial review by *Obstretrics & Gynecology*. The second manuscript presents analysis of the range and depth of physician opinions about three major partner notification strategies. This paper is under editorial review by the *American Journal of Preventive Medicine*. Below lists the manuscripts that have been published, in press, and under review. These manuscripts are attached in Appendix C.

Kasprzyk, D, Montaño, DE, St. Lawrence, JS, & Phillips, WR. The effect of variations in mode of delivery and monetary incentive on physicians' responses to a mailed survey assessing STD practice patterns. *Evaluation and the Health Professions*, 2001; 24, 3-17.

St. Lawrence, JS, Kasprzyk, D, Montaño, DE, Phillips, WR, Armstrong, KA, Leichliter, J. National Survey of US Physicians' STD Screening, Testing, Case Reporting, Clinical Management, and Partner Notification Practices, American Journal of Public Health, Accepted for publication. *American Journal of Public Health*, In Press.

Crosby, R.A, St. Lawrence, J.S., Kasprzyk, D., & Montano, D. Diagnosis of sexually transmitted diseases by rural and non-rural physicians: A national comparison of recent practices. *The Health Education Monograph Series*, In Press.

Hogben, M., St. Lawrence, JS., Kasprzyk, D., Montaño, DE., Counts, GW., McCree, DH., Phillips, WR., Scharbo-DeHaan, M. (under editorial review). Sexually transmitted disease screening by United States obstetricians and gynecologists. *Obstetrics & Gynecology*.

Hogben, M., St. Lawrence, JS., Montaño, DE., Kasprzyk, D., Phillips, WR. (under editorial review). Physicians' opinions about partner notification methods: Case reporting, patient referral, and provider referral. *American Journal of Preventive Medicine*.

In addition to these manuscripts we have worked with Dr. St. Lawrence to provide review and comments to other CDC staff on their manuscript ideas. We also are in the process of writing two more manuscripts. One manuscript is concerned with physician knowledge of STD reporting requirements, and physician rates of STD reporting. The second manuscript uses the measures of physician opinions and normative perceptions about three partner notification strategies to explain physician reported rates of using each of those three strategies. These two manuscripts are expected to be completed and submitted to peer reviewed journals within the next four months. We will also continue to collaborate with Dr. St. Lawrence to develop additional manuscripts and to review manuscript ideas proposed by other CDC staff.

Appendix A presents oral presentations on the STDCONTACT survey. Appendix B presents poster presentations of the STDCONTACT survey findings. Finally, Appendix C presents manuscripts prepared on STDCONTACT survey findings.

4.0 References

Hammett TM, Kaufman JA, Faulkner AH, Hoaglin DC, Battaglia MP (Abt Associates), Felsenstein D, Blumenthal D (Massachusettes General Hospital); 1997. Sexually Transmitted Disease (STD) Prevention in the United States: Integrated Evaluation of Public and Private Sector Disease Reporting and Service Delivery. CDC# 200-93-0633, Phase I Final Report. May 1, 1997.

National Health Care Survey, 1997, Two Parts: 1) National Ambulatory Medical Care Survey, 2) National Hospital Ambulatory Medical Care Survey, United States Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, Data from 1995 collection effort.

Oxman A.D; Scott EA; Sellors JW; Clarke JH; Millson ME; Rasooly I; Frank JW; Naus M; Goldblatt E. Jul-Aug, 1994. Partner notification for sexually transmitted diseases: an overview of the evidence. *Canadian Journal of Public Health*, 85 Suppl 1 pS41-7, ISSN

Rasooly I, Millson M.E., Frank J.W., Naus M, Coates R.A., Oxman A.D., Scott E.A., Sellors J.W., Clark J. Jul-Aug, 1994. A survey of public health partner notification for sexually transmitted diseases in Canada. *Canadian Journal of Public Health*, 85 Suppl 1 pS48-52.

APPENDIX A

Oral Presentation on the STDCONTACT Survey

System for Successfully Surveying Health Care Providers

William R. Phillips, MD, MPH, Daniel E. Montaño, PhD, Danuta Kasprzyk, PhD,

Keira Armstrong, MPH.

Battelle

Centers for Public Health Research and Evaluation

Seven Secrets to Survey Success

- Investigation: Compelling cause
- Inclusion: Proper provider population
- Introduction: Recruiting by first impression
- Invasiveness: Hassles and hurdles
- Instrument: User-friendly design
- Incentives: Questionnaire quid pro quo
- Institutions: Sponsorship and endorsement

Investigation

- Is the question compelling?
  - Interest. Importance. Impact

- Will this study improve:
  - Care of my patients
  - Health of my community
  - Organization of my work
  - Future of my profession

Inclusion

- Identifying the target group and its members
  - Physicians: Primary care
  - Other specialties
  - Non-physician clinicians

- Validity, Generalizability, Response rates

Introduction

- Recruiting by first impression
  - Letter. Logo. Mailing
  - Personal Notes
  - Telephone Follow-up
  - Scripts

Invasiveness

- Time is money
- Hassle factors
- Confidence concerns
- Cascade Effect

Instrument

- User-friendly design
- Length: 1 page, 3 minutes, 10 questions
- Format. Appearance. Color. Quality
- Ask questions the doctor can answer

Incentives

- Value views, not a token for time
- Money
- Non-monetary
- Feedback

Institutions

- Sponsorship and endorsement
  - Organizations
  - Individuals
- Key contacts
- Avoid proprietary interests.

The “I” questions

- Would I want to participate in this study?
- Am I willing to personally ask each clinician to participate?

Applying Methods: A National Mailed Survey of STD Control Practices among 7300 Physicians

Keira Armstrong, MPH, Danuta Kasprzyk, PhD, Daniel E. Montaño, PhD, William R. Phillips, MD, MPH

Battelle
Centers for Public Health Research and Evaluation

Study Funded by the Centers for Disease Control and Prevention

Goal of the Study

- First national survey on STD practice among private primary care physicians since 1968.
- Only comprehensive study of STD control practices in the USA.
- Describes and assesses:
  - STD diagnosis experience
  - STD management and treatment practices
  - STD partner management and notification practices

Background and Significance

- More than 15 million STDs per year in US
- Rates of curable STDs highest in developed world
- Majority of STD care in private sector; majority of STD research in public health sector
- Little is known about STD and HIV diagnosis, management, control and reporting practices in private practice

Response Rate

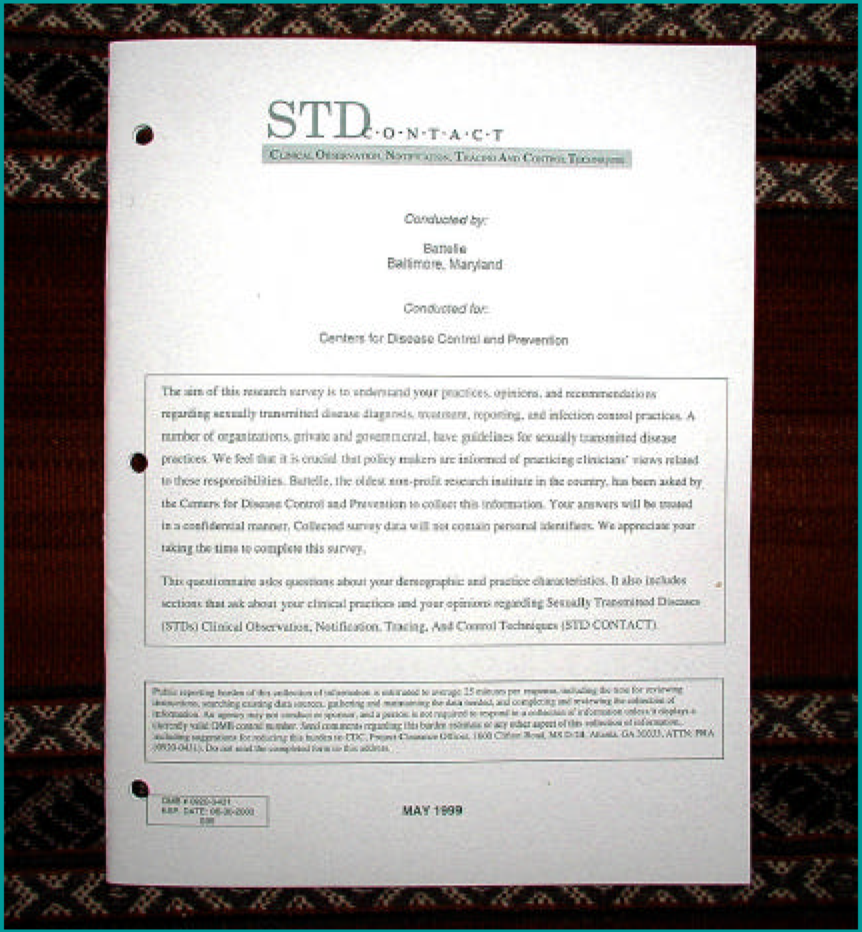
- Survey 1968:
  - 65.3% response rate
  - 5 questions
  - No HIV
- Average physician response rate in a search of 60 physician surveys = 50%
- Representative description of clinical practice in US?

Application and Tests

- Applied lessons learnt from Focus Groups:
  - Investigation
  - Inclusion
  - Institutions
- Unanswered questions:
  - Introduction and Incentives
  - Designed a methods study.

Investigation

- Conducted a Pre-Test of the Questionnaire
  - 21 pages
  - comprehensive practice and opinions



Investigation

- Telephone interview with all pre-test participants
- Covered realities of clinical practice?
- Examples of survey changes to reflect feedback:
  - physicians ask patients to contact the health department to provide information about partners
  - Perceived patient attitudes towards different partner management, notification strategies

Inclusion

- 85% of STDs in US diagnosed by:
- Obstetrics and gynecology
- Family and general practice
- General internal medicine
- Pediatrics
- Emergency medicine

Inclusion

- AMA Master File:
  - purchased the most up to date list as sampling frame
  - All allopathic and osteopathic physicians who start medical school
  - Most accurate contact and practice information
  - Pre-select on selected characteristics:
    - specialty group
    - amount of time in direct patient care

Institutions

- CDC: trusted and respected
- Battelle: independent research institute

Introduction and Incentives: Methods Study

- 6 semi-structured focus groups with physicians about Colorectal Cancer
- Questions not answered were:
  - **How much Cash?**
    - Payment for time
    - honorarium
  - **Federal Express *vs.* 1st Class?**
    - Less screening by office staff?
  - **Cost analysis?**
    - Is it worth it?

Methods Study

- Three by two factorial design
- $0, $15, $25
  - (proposed $50 but deemed too much by OMB)
- Federal Express, US first class mail
- 300 physicians randomly assigned to 6 conditions
- Sent questionnaire, cover letter, information statement, postage paid return envelope
- Three mailings, postcard reminder and telephone reminder

Methods Study: Results

Delivery Mode	Incentive ($)	N	Response % (N)
First Class	0	42	28.6 (12)
	15	49	67.3 (33)
	25	47	59.6 (28)
FedEx	0	48	27.1 (13)
	15	45	75.6 (34)
	25	47	80.9 (38)

Methods Study: Results

Delivery Mode	Total Cost*	N	Cost per Response
First Class	$302	61	$4.95
Fed Ex	$554	72	$7.69

*Cost for delivery mode only for 3 mailings; does not include staff time costs.

Methods Study: Results

Incentive Condition	Total Cost	N	Cost per Response
$15	$675	34	$19.85
$25	$1175	38	$30.92

Table includes only physicians sent survey with Fed Ex

Methods Study: Summary

- FedEx and $25 = 81% Response Rate
- Incentive plus FedEx resulted in higher response rate after FEWER mailings
- Cost of sending FedEx only slightly higher and would be less if labor costs were included.
- Only gain 5% if increase from $15 to $25
- Telephone reminder difficult and little effect

STD C•O•N•T•A•C•T:

Clinical Observation, Notification, Tracing and Control Techniques

- National Study of 7300 Physicians in 5 specialties
- 21 page survey
- Delivered Federal Express
- $15 Cash incentive
- Three Mailings, postcard reminder, no telephone
- Adjust Response Rate 70.2%

Conclusions

- Fed Ex and Incentive make a difference
- Would a larger incentive have made a larger difference?
- Working within the boundaries of a budget

- Putting all of the lessons to work:
  - Primary Care Providers in Washington State

APPENDIX B

Poster Presentations on STDcontact Survey Findings

The Effect of Variations in Mode of Delivery and Monetary Incentives on Physicians' Responses to a Mailed Survey Assessing STD Practice Patterns

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Abstract

High response rates from physicians are the key to obtaining valid and generalizeable data regarding their STD diagnosis, clinical and control practices. This study was designed to assess the effects of different levels of monetary incentives and survey delivery modes on physicians' response rates.

Methods: A 3 (incentive amount: $0, $15, $25) by 2 (delivery mode: Federal Express or first class US mail) factorial study design was used. Surveys were mailed to 300 randomly selected (from AMA Masterfile) physicians from specialties of: OB/GYN, Family Practice, Internal and Emergency Medicine, and Pediatrics. The sample was prescreened to include physicians who spent at least 50% time in direct patient care, and no PO Box address. They were randomly assigned to the 6 study conditions. All packets contained a cover letter, questionnaire, consent form and postage paid envelope and varied by delivery mode and cash incentive amount. Each physician who did not return the survey was followed up 3 times.

Results: A total of 33 (11%) physicians were ineligible or unreachable. A total of 156 physicians returned completed surveys (56% overall response rate). Response rates differed by incentive and mode of delivery. Two-way ANOVAs showed significant effects for incentive level ($F=20.2$, df = $p<.01$) and mode of delivery ($F=4.1$, $p<.05$), but no significant two-way interaction. The highest response rate (81%) was among physicians in the $25/Fed Ex condition. The lowest response rates (26%, 27%) were in the no incentive condition, regardless of mode of delivery.

Discussion: High response rates from busy practicing physicians can be achieved if surveys are made relevant to clinical practice, sponsored by a reputable organization (the CDC), include a monetary incentive, are delivered by courier, and follow accepted procedures for maximizing return rates.

Background:

- Health services research requires high response rates from physicians to obtain valid and generalizeable data regarding their clinical practices. This may have become more difficult in recent years due to increased demands on physicians' time resulting, in part, from the managed care environment.
- While mailed surveys are the most inexpensive method of data collection, they often have low response rates.
- The survey methods literature indicates that incentives and presentation of the survey material can impact response rates. There are few current physician studies that are relevant to today's practice environment.
- Nested methods study as a part of the pre-test of a national survey sponsored by the CDC.

CDC Study:

- National physician survey of STD diagnosis, treatment and control practices designed through collaboration between the Centers for Disease Control and Battelle researchers.
- Sections measure:
  - Physician and practice characteristics,
  - STD diagnosis practices and experience,
  - STD treatment and control practices,
  - Opinions about STD reporting requirements and partner notification.

Development of the Survey Instrument:

- Collaborative meetings between CDC and Battelle researchers to determine the main constructs to be included in the questionnaire as well as the items to measure them.
- Questionnaire content was pilot-tested with 9 physicians and revisions made based on their comments.
- Question content and survey format designed to maximize the ease of completion and to minimize calculations or estimations.

Development of Data Collection Design:

- Literature review on maximizing physician response:
  - Dillman's Total Design Method indicates that details matter.
  - Incentive or gift will increase response.
  - Multiple follow-ups are important.
  - A Logo can increase recognition and jog memories.
  - Variable results with endorsement by a respected organization.

- Focus Groups conducted with physicians to obtain more current information about strategies to maximize response:
  - It should be clear that the survey is conducted by an unbiased and respected research organization, <u>no</u>t a pharmaceutical company!
  - The cover letter should emphasize the relevance to practicing clinicians.
  - The survey should include a cash incentive, not checks or promises of incentives.
  - The questionnaire should be short and formatted for quick response.
  - The use of a courier service may get more attention than first class mail.

- Designed the survey based on the information collected from the above methods.
  - 21 page survey.
  - Redesigned the format of the instructions and questions.
  - Included a logo: STD Contact.
  - The letter and instructions emphasized both the relevance of the study to primary care practice and the involvement of the CDC.

- **Two methodological questions remained:**
  - Does courier delivery increase response rates by physicians?
  - How much of a cash incentive should be included?

Data Collection Design for the Response Rate Study:

- Three incentive amounts ($0, $15, $25) by two delivery modes (Federal Express, First Class US Mail).
- Simple random sample of 311 physicians selected from all physicians in the US with specialties of Family and General Practice, Internal Medicine, Obstetrics and Gynecology, Emergency Medicine.
- The 311 physicians randomly assigned to one of the six delivery by incentive study conditions.
- Followed up the initial mailing with a reminder postcard (1.5 weeks), second mailing(4 weeks), reminder phone call (6 weeks), and a third mailing (8 weeks) if necessary.

Results:

- Table 1 presents the distribution of physician specialties in the total sample.
  Note: General Internists are underrepresented due to a sampling error.
- Table 2 presents the final status of all physicians who were sent a survey.
- Table 3 presents the cumulative response rates for the six delivery mode by incentive conditions after each point of contact. A two-way ANOVA tested the effects of incentive amount and mode of delivery on final response:
  - ➢ Significant main effect for mode of delivery ($F = 4.1$, $df = 1$, $p < 0.05$).
  - ➢ Significant main effect for incentive amount ($F = 28.8$, $df = 2$, $p < 0.01$).
- Table 4 presents the results of a cost analysis of the two delivery modes and incentive amounts.
- Table 5 presents the results of a cost analysis of the two cash incentive conditions for Federal Express.

Discussion:

- The mode of delivery had no effect on response rates when no monetary incentive was provided.
- Among physicians who received a monetary incentive, Federal Express delivery resulted in a higher response rate than first class mail.
- Physicians who were sent a survey by Federal Express with a monetary incentive achieved nearly the maximum response rate after the second mailing. In contrast, among physicians who received the survey by first class mail, each follow-up contact was useful in improving response.
- The cost per response of first class mail was only slightly less than the cost per response of Federal Express (the difference shown above would have been greater if follow-up labor costs had been included in the cost analysis).

Conclusions:

This study provides crucial information about the effect of incentive amount and mode of delivery in improving physician response rates to mailed surveys. The data support the following recommendations:

- Federal Express should be used for mailed surveys.
- A cash incentive, included with the survey, is crucial.
- It is unclear if $15 or $25 results in a better rate.
- If the above conditions are used, only a follow-up postcard and second mailing should be necessary.

Table 1. Numbers of Physician Specialties in Sample

Physician Specialty	Number Sampled N	(%)
Family Medicine	126	(40.5)
General Practice	4	(1.3)
Internal Medicine	7	(2.3)
Obstetrics/Gynecology	47	(15.1)
Pediatrics	92	(29.6)
Emergency Medicine	35	(11.3)
Total	311	(100.0)

Table 2. Final Dispositions of Physicians Sampled

Final Disposition	N	(%)
Deceased or Retired	7	(2.3)
Not Locatable	11	(3.5)
Ineligible	15	(4.8)
Completed Survey	158	(50.8)
Partially Completed Survey	5	(1.6)
Refused or No Response	115	(37.0)
Total	311	(100.0)

Table 3. Cumulative Response Rate by Delivery Mode and Incentive Amount

Study Condition			Contact Attempt									
Delivery Mode	Incentive	(Denominator)	Initial Mailing %	N	Postcard Mailing %	N	Second Mailing %	N	Reminder Phone Call %	N	Final Mailing %	N
First Class	$0	(N=42)	2.4	(1)	11.9	(5)	16.7	(7)	21.1	(9)	28.6	(12)
	$15	(N=49)	32.7	(16)	49.0	(24)	55.1	(27)	61.2	(30)	67.3	(33)
	$25	(N=47)	25.5	(12)	38.3	(18)	48.9	(23)	53.2	(25)	59.6	(28)
Fed Ex	$0	(N=48)	10.4	(5)	10.4	(5)	18.8	(9)	20.8	(10)	27.1	(13)
	$15	(N=45)	46.7	(21)	57.8	(26)	75.6	(34)	75.6	(34)	75.6	(34)
	$25	(N=47)	46.8	(22)	57.4	(27)	74.5	(35)	76.6	(36)	80.9	(38)

Table 4. Delivery Costs by Delivery Mode

Delivery Mode	Contact Attempt: Initial Mailing N	Initial Mailing Cost	Second Mailing N	Second Mailing Cost	Final Certified Mailing N	Final Certified Mailing Cost	Total Cost	Number Respondents	Cost per Response
First Class	103	($128)	55	($68)	41	($106)	$302	61	$4.95
Fed Ex	105	($362)	39	($135)	22	($57)	$554	72	$7.69

Table 5. Incentive Costs by Condition

Incentive Condition	Total Cost	Number Respondents	Cost per Response
$15	$675	34	$19.85
$25	$1175	38	$30.92

Infection control strategies by a national sample of United States primary care and emergency room physicians after diagnosis of HIV.

Centers for Public Health Research and Evaluation

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Centers for Disease Control and Prevention

Background:

More than 15 million STDs occur each year in the United States. Rates of curable STDs in the US are the highest in the developed world and even higher than in some developing countries.

While much of the STD research, disease surveillance and prevention has taken place in local and state public Health Departments, recent evidence suggests that the majority of STD care takes place in the private sector.

Relatively little is known about STD and HIV diagnosis, management, control and reporting practices among private physicians. The last national survey was conducted in 1968 and major changes in health service structures, diagnosis and treatment technology and disease epidemiology have occurred since then.

Purpose:

The STD*CONTACT (Clinical Observation, Notification, Tracing and Control Techniques) survey was designed by CDC and Battelle researchers to measure the following behaviors for four STD's, **syphilis, gonorrhea, chlamydia, and HIV:**

- screening and diagnosis practice/experience
- case reporting
- partner notification
- clinical management practices

The purpose of this presentation is to describe:

- current HIV and AIDS infection control and partner management strategies in primary care and emergency room (ER) settings
- demographic, practice, structural, and individual variables associated with variations in these practices across the US.

Survey Procedures:

Sample:

- National sample of 7300 physicians selected from AMA Physician Master File
- Five specialties that provide majority of STD care in the US: Family Physicians, General Internists, Obstetrician/Gynecologists, Pediatricians, and Emergency Medicine Physicians
- Spend over 50% time in direct patient care
- See patients between the ages of 13 and 60

Mailed Survey:

- Conducted between May 1999 and January 2000
- Sent by Federal Express
- $15 dollars cash included
- Reminder postcard
- Follow-up at 4, 7, 15 weeks
- 4226 Completed Surveys--**70.2% adjusted response rate**

Measure:

- Physicians were asked to rate the likelihood of taking clinical actions regarding HIV based on the following scale:

1 = Never; 2 = Sometimes; 3 = Half the time; 4 = Usually; 5=Always

- Scores are presented as means
- **Shading indicates significant difference ($p < 0.05$)**
- light=lowest, dark=highest.

Respondent Characteristics:

- Mean age of 46.2 years
- 72% male
- 81% white, 13% Asian, 4% African-American, 5% Hispanic or Latino ethnicity
- In practice an average of 18 years
- Spend 42.6 hours per week in direct patient care and see 98.1 patients per week
- 87% work in private practice settings
- 78% diagnosed at least 1 STD in past year
- 62% report ever diagnosing a case of HIV

Results: ***Table 1 shows clinical actions for all physicians***
Tables 2-6 show comparisons of the clinical actions by physician and practice characteristics
Note: only physicians who had ever diagnosed a case of HIV were included in these analyses (N = 2602)

Table 1--All Physicians

Clinical Action	Mean
Refer patient elsewhere for management	4.13
Tell patient to use condoms	4.76
Tell patients to inform partners of exposure	4.82
Tell patient to tell partner to seek care	4.83
Follow-up to see if patient referred partners for treatment	3.02
Collect partner information and contact	1.60
Send partner information to Health Department	1.98
Instruct patient to notify Health Department and provide partner info	2.92
Report patient name to the Health Department	3.33
Lab contacts the Health Department	3.67

- Most physicians rely on individual infection control strategies such as telling patients to use condoms rather than direct partner tracing strategies.
- Collecting partner information is rare.
- Physicians report an average of "sometimes" reporting HIV to the Health Department.

Poster Designed by: Collin May [1]

Table 2--Specialty

Clinical Action	Specialty ER	FP/GP	IM	OB	PED
Refer Patient Elsewhere	4.46	4.10	3.84	4.21	4.49
Tell Patient to use Condoms	4.58	4.77	4.72	4.89	4.82
Tell patients to inform partners of exposure	4.66	4.84	4.80	4.93	4.88
Tell patient to tell partner to seek care	4.72	4.84	4.83	4.91	4.85
Follow up to see if partner got treatment	1.40	3.12	3.09	3.57	3.44
Collect partner information and contact	1.26	1.66	1.59	1.48	1.82
Collect partner info and send it to HD	1.52	2.10	1.82	2.00	2.33
Instruct patient to contact HD	2.69	2.91	2.85	2.97	3.24
Report patient name to HD	2.52	3.64	3.19	3.30	3.47
Lab Contacts HD	3.65	3.73	3.58	3.65	3.70

- Emergency Medicine physicians are most likely to refer patients elsewhere and consistently less likely to perform infection control actions.
- Internists are the least likely to refer their HIV positive patients.
- Obstetricians are most likely to do counseling and to follow up to see if partners were treated.
- Family Physicians are most likely to report patient names to the Health Department.
- Contacting partners directly is rare among all specialty groups.

Table 3--Community Size

Clinical Action	Community Size: Rural (<25k)	Small City (25-100k)	City/ Suburb (>100k)	Large City (>250k)
Refer Patient Elsewhere	4.09	4.03	4.24	4.11
Tell Patient to use Condoms	4.75	4.81	4.76	4.73
Tell patients to inform partners of exposure	4.84	4.82	4.80	4.84
Tell patient to tell partner to seek care	4.81	4.87	4.82	4.83
Follow up to see if partner got treatment	2.98	3.05	2.96	3.08
Collect partner information and contact	1.77	1.58	1.51	1.59
Collect partner info and send it to HD	2.22	2.01	1.91	1.86
Instruct patient to contact HD	3.05	3.05	2.81	2.81
Report patient name to HD	3.48	3.41	3.30	3.19
Lab Contacts HD	3.41	3.67	3.81	3.72

- Physicians in rural areas are:
  - more likely to contact partners directly, to collect partner information and send it to the Health Department, or to advise patients to contact the Health Department themselves.
  - less likely to rely on the lab to contact the Health Department.

Table 4--Practice Type

Clinical Action	Practice Type: Solo	Single Specialty	Multi-Specialty	HMO
Refer Patient Elsewhere	4.10	4.23	4.01	3.96
Tell Patient to use Condoms	4.73	4.79	4.74	4.77
Tell patients to inform partners of exposure	4.84	4.81	4.81	4.86
Tell patient to tell partner to seek care	4.84	4.83	4.83	4.84
Follow up to see if partner got treatment	3.34	2.85	3.20	2.89
Collect partner information and contact	1.77	1.48	1.59	1.75
Collect partner info and send it to HD	2.13	1.91	2.07	1.83
Instruct patient to contact HD	3.25	2.92	2.82	2.36
Report patient name to HD	3.41	3.24	3.37	3.43
Lab Contacts HD	3.68	3.66	3.67	3.68

- Physicians in single specialty group practices are most likely to refer HIV patients elsewhere and least likely to follow up with or contact partners.
- Those in solo practices are most likely to collect partner information, follow-up with partners, or instruct patients to contact the Health Department.
- No practice type differences in provision of prevention advice and case reporting exist.

Table 5--Time in Practice

Clinical Action	Time In Practice: 1-10 years	11-20 years	> 21 years
Refer Patient Elsewhere	4.01	4.08	4.34
Tell Patient to use Condoms	4.83	4.75	4.66
Tell patients to inform partners of exposure	4.86	4.80	4.82
Tell patient to tell partner to seek care	4.87	4.80	4.83
Follow up to see if partner got treatment	3.04	2.90	3.14
Collect partner information and contact	1.54	1.61	1.64
Collect partner info and send it to HD	1.91	1.92	2.07
Instruct patient to contact HD	2.63	2.95	3.19
Report patient name to HD	3.19	3.28	3.54
Lab Contacts HD	3.58	3.68	3.75

- Physicians with less time in practice are:
  - least likely to refer HIV patients or to report cases to the Health Department.
  - most likely to discuss prevention strategies with patients.
- Those with more time in practice are:
  - more likely to follow up to see if partner seeks treatment and to report patient names to the Health Department.

Table 6--Region

Clinical Action	Region: West	Midwest	South	Northeast
Refer Patient Elsewhere	3.98	4.26	4.22	3.99
Tell Patient to use Condoms	4.79	4.73	4.71	4.84
Tell patients to inform partners of exposure	4.88	4.82	4.78	4.86
Tell patient to tell partner to seek care	4.89	4.81	4.81	4.84
Follow up to see if partner got treatment	3.08	2.89	2.93	3.22
Collect partner information and contact	1.66	1.58	1.62	1.51
Collect partner info and send it to HD	2.12	2.04	2.03	1.69
Instruct patient to contact HD	2.73	2.85	3.21	2.68
Report patient name to HD	3.53	3.28	3.55	2.80
Lab Contacts HD	3.85	3.91	3.62	3.36

- Physicians in the Northeast are the least likely to refer HIV positive patients but they are also least likely to participate in any of the reporting actions.
- Physicians in the South are least likely to discuss condoms or to talk with patients about notifying partners.

Results Not Tabled:

Gender:

- Women were more likely to take personalized counseling approaches such as telling patients to use condoms or discussing why it is important to notify partners.
- Men were more likely to contact partners and to tell the patient to notify the Health Department.
- There was no difference between men and women on referring HIV positive patients or reporting patient name to the Health Department.

Full Time / Part Time:

- Physicians working full time were more likely to report patient name or tell the patient to notify the Health Department.
- Part time physicians were more likely to follow up to see if the partner received treatment.
- These two groups did not differ on frequency of counseling or referral.

Support Staff per Physician:

- Physicians with fewer support staff are slightly more likely to follow up to ask if the partner has been treated or to report the patient's name to the Health Department. This could indicate that in practices with fewer auxiliary staff, physicians must take on more responsibility for partner management and public health reporting practices.

Patient Volume:

- Patient volume was not associated with the likelihood of infection control practices.

Conclusions:

- Physicians report an average of "sometimes" reporting HIV to the Health Department. The low reporting scores imply that significant holes exist in both HIV surveillance, and partner management systems in the US.
- Rural physicians may be more willing to participate in partner tracing and contact strategies and may play an important role as HIV incidence increases in rural areas.
- Continuing education with physicians could increase the comfort with discussions about infection control.
- Most physicians discuss using condoms and the importance of contacting partners. Emergency Medicine physicians, physicians with more than 11 years in practice and physicians practicing in the South are least likely to discuss these issues with patients and could be targeted for continuing education.
- Very few physicians perform partner tracing or notification.

Referral patterns for HIV positive patients among a national sample of primary care and emergency room physicians in the United States

Battelle
Centers for Public Health Research and Evaluation

William R. Phillips, M.D., MPH[1,3], Keira Armstrong, MPH[1], Janet S. St. Lawrence, Ph.D.[2], Danuta Kasprzyk, Ph.D.[1], Daniel E. Montaño, Ph.D.[1]

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[2]Centers for Disease Control and Prevention (CDC), Atlanta
[3]Department of Family Medicine, University of Washington, Seattle

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Background:

More than 15 million STDs occur each year in the United States. Rates of curable STDs in the US are the highest in the developed world and even higher than in some developing countries.

While much of the STD research, disease surveillance and prevention has taken place in local and state public Health Departments, recent evidence suggests that the majority of STD care takes place in the private sector.

Relatively little is known about STD and HIV diagnosis, management, control and reporting practices among private physicians. The last national survey was conducted in 1968 and major changes in health service structures, diagnosis and treatment technology and disease epidemiology have occurred since then.

Purpose:

The STD*CONTACT (Clinical Observation, Notification, Tracing and Control Techniques) survey was designed by CDC and Battelle researchers to measure the following behaviors for four STD's, **syphilis, gonorrhea, chlamydia, and HIV:**

- screening and diagnosis practice/experience
- case reporting
- partner notification
- clinical management practices

The purpose of this presentation is to describe:

- physicians' <u>referral</u> practices after diagnosis of HIV in primary care and emergency room (ER) settings
- demographic, practice, structural, and individual variables associated with variations in these practices across the US.

Survey Procedures:

Sample:

- National sample of 7300 physicians selected from AMA Physician Master File
- Five specialties that provide majority of STD care in the US:
  - -Family Physicians,
  - -General Internists,
  - -Obstetrician/Gynecologists,
  - -Pediatricians,
  - -Emergency Medicine Physicians.
- Spend over 50% time in direct patient care
- See patients between the ages of 13 and 60

Mailed Survey:

- Conducted between May 1999 and January 2000
- Sent by Federal Express
- $15 dollars cash included
- Reminder postcard
- Follow-up at 4, 7, 15 weeks
- 4226 completed surveys--**70.2% adjusted response rate**

Measure:

Physicians were asked how often they:

- refer their HIV positive patients elsewhere for management
- take various clinical actions with HIV positive patients

on the following scale:

1 = Never; 2 = Sometimes; 3 = Half the time; 4 = Usually; 5=Always

Respondent Characteristics:

- Mean age of 46.2 years
- 72% male
- 81% white, 13% Asian, 4% African-American, 5% Hispanic or Latino ethnicity
- In practice an average of 18 years
- Spend 42.6 hours per week in direct patient care and see 98.1 patients per week
- 87% work in private practice settings
- 78% diagnosed at least 1 STD in past year

Results:

Physicians were dichotomized into two groups. Those who answered "never, sometimes, or half the time refer" were coded as those who "keep HIV patients." Those who answered "usually or always refer" were coded as those who "refer HIV patients."

- Overall, 62% of physicians in the US have diagnosed HIV.
- Among physicians who have seen HIV positive patients, 21% keep rather than refer them.
- By contrast, 80% keep syphilis and 90% keep chlamydia and gonorrhea patients

(See tables and summaries on reverse side.)

Conclusions:

- The fact that only one-fifth of US physicians keep their HIV positive patients compared with the vast majority of physicians who keep patients with other STDs, indicates that HIV care is not routine in primary care.
- Physicians who refer versus keep HIV positive patients are just as likely to have infection control discussions with their patients and they are just as likely to report patients to the Health Department.
- These findings indicate that all physicians are important to infection control, partner notification and disease surveillance activities.
- The fact that about two-thirds of physicians have diagnosed HIV, yet few keep these patients, suggests a need for more HIV care training of primary care physicians.

Poster Designed by: Collin May [1]

Table 1--Physician and Practice Characteristics by % who have diagnosed HIV and % who keep HIV patients

Physician and Practice Characteristics	% who have diagnosed HIV (among all physicians; N=4226)	% who keep HIV patients (among physicians who have diagnosed HIV; N=2602)
Gender		
Male	63.7	21.7
Female	58.7	19.6
Specialty		
Emergency	65.6	12.5
Family / GP	69.2	21.4
Internist	81.9	28.4
Obstetrician / Gyn	45.9	18.4
Pediatrician	39.2	12.6
Community Size		
Rural (LT 25k)	56.2	22.9
Small City (25-100k)	58.2	23.7
City/Suburb (100-250k)	62.1	16.7
Large City (GT 250k)	72.5	21.9
Practice Type		
Solo	55.5	21.4
Single Specialty	62.5	17.8
Multi-Specialty	65.1	24.8
HMO	72.2	26.1
Part Time/Full Time		
Part Time	59.6	21.9
Full Time	64.3	20.4
Time in Practice		
1-10 years	66.6	23.6
11-20 years	63.9	22.6
GT 21 years	56.7	16.0
Region		
West	60.7	25.1
Midwest	54.0	16.8
South	69.4	18.5
Northeast	63.3	25.1

- Shading indicates significant difference ($p < 0.05$)
- light=lowest, dark=highest

Table Highlights:

Table 1, Column 1:

- Physicians who have diagnosed HIV are more often male, practicing as a General Internist, live in large cities, work in HMOs and multi specialty group practices, work full time, have had less time in practice, and live in the South or the Northeast.

Table 1, Column 2:

- Internists are most likely to keep HIV positive patients while Emergency Medicine physicians and Pediatricians refer most often. Physicians in mid-sized cities are more likely to refer their HIV positive patients. Physicians in HMO or Multi-specialty group practice, with fewer years in practice or who live in the West or Northeast are more likely to keep HIV positive patients.

- Number of clinic support staff and patient volume are unrelated to referral of HIV positive patients.

Table 2:

- Physicians who keep versus refer their HIV positive patients are more likely to follow-up with patients to determine whether their partners got treated and less likely to tell the patient to contact the Health Department.
- Physicians who keep HIV positive patients are no different than physicians who refer on all other clinical actions.

Table 2--Partner management practices among physicians who have diagnosed HIV

Clinical Action	% Usually or Always take each clinical action	
	Physicians who refer HIV patients	Physicians who keep HIV patients
Tell Patient to use Condoms	94.7	96.1
Talk about why it is important to tell partners	97.7	97.4
Tell patient to tell partner to seek care	97.9	97.3
Collect partner information and contact	10.4	12.1
Follow up to see if partner got treatment	46.3	53.9
Collect partner info and send it to HD	20.9	24.1
Instruct Patient to contact HD	46.5	39.7
Report patient name to HD	57.4	59.5
Lab Contacts HD	68.8	64.7

- Shading indicates significant difference ($p < 0.05$)
- light=lowest, dark=highest

HIV and AIDS public health reporting practices among a national sample of primary care and emergency room physicians in the United States

Centers for Public Health Research and Evaluation

Danuta Kasprzyk, Ph.D.[1], Daniel E. Montaño, Ph.D.[1], William R. Phillips, M.D., MPH[1,3], Keira Armstrong, MPH[1], Janet S St. Lawrence, Ph.D.[2]

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- Five specialties that provide majority of STD care in the US: Family Physicians, General Internists, Obstetrician/Gynecologists, Pediatricians, and Emergency Medicine Physicians
- Spend over 50% time in direct patient care
- See patients between the ages of 13 and 60

Mailed Survey:

- Conducted between May 1999 and January 2000
- Sent by Federal Express
- $15 dollars cash included
- Reminder postcard
- Follow-up at 4, 7, 15 weeks
- 4226 completed surveys–**70.2% adjusted response rate**

Analysis:

- Included the 2602 (62%) physicians who have diagnosed HIV
- Determined % of physicians who always report:
  - -AIDS in all 50 states
  - -HIV in 39 states where it is required

Measure:

- Physicians were asked to indicate what percent of HIV and AIDS cases are reported to the Health Department by them or their lab

Respondent Characteristics:

- Mean age of 46.2 years
- 72% male
- 81% white, 13% Asian, 4% African-American, 5% Hispanic or Latino ethnicity
- In practice an average of 18 years
- Spend 42.6 hours per week in direct patient care and see 98.1 patients per week
- 87% work in private practice settings
- 78% diagnosed at least 1 STD in past year
- 62% had ever diagnosed a case of HIV

Results:

Overall:

- AIDS Reporting:
  - 46% of physicians say they report
  - 74% rely on lab to report
  - 77% believe reported by physician or lab
- HIV Reporting:
  - 48% of physicians say they report
  - 78% rely on lab to report
  - 81% believe reported by physician or lab
- Physician and practice characteristics associated with AIDS and HIV reporting were nearly identical

(See tables and summaries on reverse side)

Conclusions

- Less than half of physicians in the US who have diagnosed HIV indicated that they always report cases of HIV and AIDS to the Health Department
- Even among physicians who believe that HIV and AIDS reporting is "very worthwhile", only half indicated they always report cases to the Health Department
- About 3/4 of physicians believe their labs report HIV and AIDS cases.
  - Thus, it appears that many physicians rely on their labs rather than report cases themselves
  - However, since this was a survey of physicians, it is not known how consistently these labs actually do report cases of HIV and AIDS
- Some physician groups with lower reporting rates (e.g., in cities, ER) are slightly more likely to rely on their lab to report
- Even if physicians are correct about their labs reporting, about 20% of physicians indicated that neither they nor their labs report all HIV and AIDS cases
- Thus, it appears that there are major gaps in case reporting, impacting HIV/AIDS surveillance statistics.

Poster Designed by: Collin May [1]

Table 1--AIDS and HIV reporting by physician characteristics

Physician Characteristics	% who always report AIDS	% who believe lab reports AIDS	% who always report HIV	% who believe lab reports HIV
Gender				
Male	46	74	48	78
Female	44	72	46	80
Specialty				
Emergency	22	80	20	85
Family / GP	55	72	57	76
Internist	40	71	42	76
Obstetrician / Gyn	42	78	50	82
Pediatrician	51	76	55	82
Part Time/Full Time				
Part Time	41	74	42	80
Full Time	48	73	51	78
Time in Practice				
1-10 years	39	70	42	76
11-20 years	45	73	47	79
GT 21 years	52	78	54	81
Believe Reporting "Very Worthwhile"				
Yes	51	76	50	79
No	38	70	37	73

*color indicates significant difference ($p < 0.05$)

Lowest
Highest

Table 1 Results:

- HIV and AIDS reporting are higher among:
  - Family Physicians and Pediatricians
  - Physicians practicing full time
  - Physicians who have been in practice longer
  - Physicians who believe HIV/AIDS reporting is "very worthwhile"
- Emergency Medicine physicians are least likely to report HIV and AIDS

Table 2--AIDS and HIV reporting by practice characteristics

Practice Characteristics	% who always report AIDS	% who believe lab reports AIDS	% who always report HIV	% who believe lab reports HIV
Community Size				
Rural (LT 25k)	52	68	54	72
Small City (25-100k)	47	73	49	77
City / Suburb (100-250k)	45	75	46	82
Large City (GT 250k)	41	76	43	81
Practice Type				
Solo	51	77	54	79
Single Specialty	43	73	45	79
Multi-Specialty	44	73	45	78
HMO	50	67	50	77
Support Staff / Doctor				
0 per Doc	44	72	47	78
0.5 or less per Doc	49	72	51	79
0.5 - 1 per Doc	47	72	53	78
1-2 per Doc	49	73	50	75
GT 2 per Doc	37	78	39	81
Region				
West	54	74	50	79
Midwest	40	79	41	82
South	51	75	52	77
Northeast	33	64	42	70

*color indicates significant difference ($p < 0.05$)

Lowest
Highest

Table 2 Results:

- HIV and AIDS reporting are higher among:
  - Rural physicians than among those in large cities
  - Solo and HMO physicians than among physicians in group practices
  - Physicians in the South and West than in the Northeast and Midwest
- Reporting is lowest among physicians with the greatest number of clinic support staff
- Physicians in the Northeast are least likely to report and least likely to rely on the lab to report AIDS

Knowledge of HIV and AIDS public health reporting requirements among a national sample of primary care and emergency room physicians in the United States

Battelle
Centers for Public Health Research and Evaluation

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CDC
Centers for Disease Control and Prevention

Background:

More than 15 million STDs occur each year in the United States. Rates of curable STDs in the US are the highest in the developed world and even higher than in some developing countries.

While much of the STD research, disease surveillance and prevention has taken place in local and state public Health Departments, recent evidence suggests the majority of STD care takes place in the private sector.

Relatively little is known about STD and HIV diagnosis, management, control and reporting practices among private physicians. The last national survey was conducted in 1968 and major changes in health service structures, diagnosis and treatment technology and disease epidemiology have occurred since then.

Purpose:

The STD*CONTACT (Clinical Observation, Notification, Tracing and Control Techniques) survey was designed by CDC and Battelle researchers to measure the following behaviors for four STD's, **syphilis, gonorrhea, chlamydia, and HIV:**

- screening and diagnosis practice/experience
- case reporting
- partner notification
- clinical management practices

The purpose of this presentation is to describe:

- physicians' knowledge of HIV and AIDS reporting requirements
- demographic, practice, structural, and individual variables associated with variations in this knowledge

Survey Procedures:

Sample:

- National sample of 7300 physicians selected from AMA Physician Master File
- Five specialties that provide majority of STD care in the US: Family Physicians, General Internists, Obstetrician/Gynecologists, Pediatricians, and Emergency Medicine Physicians
- Spend over 50% of time in direct patient care
- See patients between the ages of 13 and 60

Mailed Survey:

- Conducted between May 1999 and January 2000
- Sent by Federal Express
- $15 dollars cash included
- Reminder postcard
- Follow-up at 4, 7, 15 weeks
- 4226 Completed surveys--**70.2% adjusted response rate**

Measure:

- Physicians were asked to indicate whether the law requires reporting of HIV and AIDS in their state, with answers of "Yes", "No", or "Uncertain".
- Only those physicians who gave the correct Yes or No answer were coded as knowing the law of their state.

Respondent Characteristics:

- Mean age of 46.2 years
- 72% male
- 81% white, 13% Asian, 4% African-American, 5% Hispanic or Latino ethnicity
- In practice an average of 18 years
- Spend 42.6 hours per week in direct patient care and see 98.1 patients per week
- 87% work in private practice settings
- 78% diagnosed at least 1 STD in past year
- 62% report ever diagnosing a case of HIV

Overall Results:

- 63% of physicians were aware that they are required by law to report AIDS cases
- 58% were aware of their state law regarding HIV reporting (eleven states do not require reporting of HIV cases)

(See tables and summaries on reverse side)

Conclusions:

- Community based physicians play an important role in HIV and AIDS case finding and reporting, yet about 40% lack awareness of their reporting requirements.
- Improved dissemination of information about reporting requirements could particularly focus on:
  - -Emergency Medicine physicians,
  - -physicians practicing part time,
  - -physicians in large urban settings,
  - -physicians in single specialty groups,
  - -physicians in the Northeast US,
  - -physicians recently finished with training.
- However, dissemination of reporting requirements is unlikely to be sufficient since only about 63% of physicians who know that HIV and AIDS are reportable indicated that they always report these cases.
- Over 80% of physicians who know that HIV and AIDS are reportable depend on their lab to report cases.
  - -Given the heavy reliance on lab reporting, studies should be conducted to document lab reporting.
- Therefore, in addition to improving physician knowledge of reporting requirements, policy level interventions and structural changes are needed to enable physician case reporting of HIV and AIDS.

Poster Designed by: Collin May [1]

Table 1--Knowledge of reporting requirements by physician characteristics

Physician Characteristics	% who know the AIDS reporting law of their state	% who know the HIV reporting law of their state
Gender		
Male	63	57
Female	61	56
Specialty		
Emergency	43	48
Family / GP	68	62
Internist	62	55
Obstetrician / Gyn	60	57
Pediatrician	66	57
Part Time/Full Time		
Part Time	58	55
Full Time	65	59
Time in Practice		
1-10 years	58	56
11-20 years	63	55
GT 21 years	66	60
		highest
Color indicates significant differences (p<0.05)		lowest

Table 2--Knowledge of reporting requirements by practice characteristics

Practice Characteristics	% who know the AIDS reporting law of their state	% who know the HIV reporting law of their state
Community Size		
Rural (LT 25k)	67	59
Small City (25-100k)	65	58
City/Suburb (100-250	61	56
Large City (GT 250k)	58	57
Practice Type		
Solo	67	59
Single Specialty	59	57
Multi-Specialty	64	55
HMO	67	59
Region		
West	65	56
Midwest	60	59
South	68	60
Northeast	55	53
Support Staff/Doctor		
0 per Doc	63	58
0.5 or less per Doc	64	58
0.5 - 1 per Doc	62	59
1-2 per Doc	64	57
GT 2 per Doc	58	55
Patients per Hour		
Up to 2	61	57
Between 2 and 3	62	57
GT 3	65	58
		highest
Color indicates significant differences (p< 0.05)		lowest

Table 3--Knowledge that reporting is required by reporting behavior of physicians

Aware Reporting Required for:	% Who Always Report	% Believe Lab Reports
AIDS	62	80
HIV	64	85

Table 1 Results:

- Emergency Medicine physicians are least knowledgeable about AIDS and HIV reporting laws, while Family Physicians are most knowledgeable.
- Physicians in full time practice are more knowledgeable about AIDS and HIV reporting laws than those practicing part time.
- Greater length of time in practice is associated with increased knowledge of reporting laws.
- No gender difference in knowledge of reporting laws.

Table 2 Results:

- Physicians in rural communities are more knowledgeable about AIDS reporting laws than physicians in large urban communities.
- Physicians in solo practice and HMO’s are more knowledgeable about AIDS reporting laws than physicians in single specialty group practices.
- Physicians in the Northeast region of the US are least knowledgeable about AIDS and HIV reporting laws.
- Number of clinic support staff and patient volume are unrelated to knowledge of reporting requirements.

Table 3 Results:

- Among physicians who are aware that AIDS and HIV reporting are required in their state, about 63% indicated that they always report AIDS and HIV cases.
- Over 80% of physicians who are aware that AIDS and HIV reporting are required believe their lab reports the cases.

APPENDIX C

Manuscripts Prepared on STDcONTACT Survey Findings

THE EFFECTS OF VARIATIONS IN MODE OF DELIVERY AND MONETARY INCENTIVE ON PHYSICIANS' RESPONSES TO A MAILED SURVEY ASSESSING STD PRACTICE PATTERNS

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High response rates from physicians are key to obtaining valid and generalizable data regarding their sexually transmitted disease (STD) diagnosis, treatment, and control practices. A factorial (3 × 2) study was designed using varying cash incentives ($0, $15, $25) and delivery modes (Federal Express, U.S. mail). Surveys, with three follow-up mailings, were sent to a national probability sample of 311 physicians in OB-GYN, family practice, internal and emergency medicine, and pediatrics specialties. Overall, 156 physicians returned completed surveys (56% overall response rate). Significant effects for incentive level (*$F = 28.2$, $df = 2$, $p < .01$) and delivery mode (*$F = 4.1$, $df = 1$, $p < .05$*) existed. Highest response was among physicians in the $25-Fed Ex condition (81%). High response rates from busy practicing physicians can be achieved if surveys are relevant to clinical practice, sponsored by a reputable organization (the CDC), include a monetary incentive, and are delivered by courier.*

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BACKGROUND

Health services research requires high response rates from physicians to obtain valid and generalizable data regarding their clinical practices. This may have become more difficult in recent years because of increased demands on physicians' time resulting, in part, from the managed care environment. In preparing to conduct a national mail survey of physicians' sexually transmitted disease (STD) diagnosis, treatment, and control practices, we conducted a literature review and collected qualitative information to identify methods that maximize response.

Mailed surveys are the least expensive form of data collection, but researchers have had to contend with low response rates. Thus, Dillman proposed a mailed survey methodology, based on social exchange theory, to obtain response rates as high as 70% to 75% (Dillman, 1978). Dillman's total design method (TDM) recommends that researchers pay attention to the details of contact with respondents, including wording of letters, incentives related to completion, length of questionnaires, and use of multiple follow-up contacts with survey participants. Studies applying the TDM confirm that preliminary notification, multiple follow-ups, incentives, use of first class-stamped envelopes, and appropriate salutations are effective in increasing survey response rates (Berry & Kanouse, 1987; Choi, Pak, & Purdham, 1990; Dillman, 1978; Harvey, 1987; Thran & Berk, 1993). Meta-analyses conducted by Yammarino, Skinner, and Childers (1991) and Fox, Crask, and Kim (1988) also found that preliminary notification, follow-up, return envelope with postage, and monetary incentives were effective in increasing response rates. Fox et al. found that sponsorship of surveys by organizations increased response rates, but this was not found by Yammarino et al. The effect on response rate of other variables, such as sponsorship by specific organizations, use of personalization techniques in mailings, and length of questionnaires, is inconsistent (Dillman, 1978; Harvey, 1987; Maheux, Legault, & Lambert, 1989; Mullen, Easling, Nixon, Koester, & Biddle, 1987).

Generally, larger incentive amounts are associated with higher response rates, though there is evidence of diminishing returns at the largest levels of monetary incentives (Church, 1993; Everett, Price, Beddell, & Telljohann, 1997; Fox et al., 1988; Yammarino et al., 1991). There also is evidence that even modest incentives can increase response rates among physicians (Asch, Christakis, & Ubel, 1998; Deehan, Templeton, Taylor, Drummond, & Strang, 1997). A meta-analysis conducted by Church found that the strongest incentive effect was found when monetary incentives were included with initial survey mailings rather than being promised upon return of the survey.

Few of the survey methods studies, reviews, and meta-analyses on response rates included physician surveys. There is some evidence that physicians have lower response rates than do others (Asch, Jedrziewski, & Christakis, 1997). Therefore, we conducted a review of physician surveys published between 1990 and 1997 to assess the effect on response rate of endorsements, reminders, and incentives. A literature search using MEDLINE, Psychological Abstracts, and Sociological Abstracts identified 60 physician surveys that included local area-, state-, regional-, and national-level surveys. Response rates ranged from 32.1% to 91.8%, with a mean response rate of 52%. Few of these surveys applied Dillman's (1978) recommended TDM procedures or other procedures shown by survey methods researchers to be effective in increasing response rates. Those that did had higher response rates, an average of 85% (O'Connor et al., 1997; Wilkins, Hueston, MacCrawford, Steele, & Gerken, 1997).

Among the 60 physician studies we reviewed, 9 included an endorsement from a national, local, or state association, yielding physician response rates 20% lower than those that did not report use of such endorsements (36% vs. 56%). Twenty-two of the studies used follow-up mail or telephone reminders, resulting in an average 10% higher response rate than the surveys that did not use reminders (60% vs. 50%). In their analysis of response rates to mailed surveys Asch and his colleagues (1997) found that those studies that included reminders had up to a 13% improvement in response rates. Only 7 studies used an incentive to increase response rates. Incentives included payments of $1 to $25, whereas 1 study used a computer diskette with a risk program as an incentive to participate. These studies obtained 14% greater response rates than those that provided no incentive (65% vs. 51%). The importance of monetary incentives has also been demonstrated by four methodological studies designed to test the effects of incentives on physician response rates (Asch et al., 1998; Berk, Edwards, & Gay, 1993; Everett et al., 1997; Tambor et al., 1993).

Based on the analysis of physician surveys and review of the methods research literature, it appeared that the methods needed to maximize mailed survey response rates among physicians include: (a) use of appropriate salutations, stamped envelopes, multiple reminder notices by mail or telephone, and (b) inclusion of an incentive with the initial mailing. It appears that endorsement by a third party does not improve response.

Few of the studies on physician response are recent, so they may not reflect procedures that maximize physician response in the current health care environment. Therefore, we next conducted six semi-structured focus groups with physicians to obtain more current information about strategies to maximize response. We obtained consensus from physicians about the following methods to increase response:

- It should be clear that the survey is being conducted by an unbiased and respected research organization that will not profit from the results.
- The cover letter and instructions should explain why it is crucial for practicing clinicians to participate in the survey and describe how the findings will be used to improve patient care.
- The survey mailing should include a cash incentive rather than a check or a promise of an incentive upon survey completion.
- Multiple follow-up procedures should be used to remind physicians to complete and return the questionnaire.
- The questionnaire and cover letters should include a simple but memorable logo.
- The questionnaire should be relatively short.
- Questions should be clear and formatted so that it is easy for busy clinicians to quickly mark their responses. Questions should not require physicians to look up information about their practices.
- Delivery of the survey by a courier service may be better than first class mail because courier service deliveries are not screened by office staff and are more likely to get the physician’s attention.

We designed the survey of STD diagnosis, treatment and control practices, and the data collection procedures to incorporate all of the above key features. However, there were two elements identified in the group discussions that required further investigation. First, although our literature review and discussion groups indicated that a monetary incentive should be provided, there was no consensus about the most appropriate incentive amount required to maximize response. Re- search on the effect of incentive amount on physician response rate is limited and most physician surveys do not include incentives. There is also evidence of an inverted-U relationship between incentive amount and response rates. That is, when the incentive is viewed by a respondent as a payment for time rather than as an honorarium, and the amount is not close to the respondent's salary, response drops off. It is unclear what amount will be large enough to encourage physicians to participate in a survey, yet small enough to be viewed as an honorarium rather than as a payment for their time. Second, many group discussion participants indicated that surveys delivered by a courier service might obtain higher physician responses than first class mail because courier deliveries are less likely to be screened and discarded by office staff. However, no studies have investigated the effect of courier service delivery during the first mailing on survey response rate.

Therefore, we designed a pretest of the survey to determine whether survey delivery by courier service results in higher response than first class mail delivery and to identify a monetary incentive amount that will maximize physician response. The primary goal of this response rate study was to identify the combination of delivery mode and incentive level that will maximize physicians' response to our survey. An additional goal was to conduct a cost analysis to assess whether the increased response rate using a courier service and/or paying a larger incentive is worth the additional cost. A secondary goal of the pretest was to determine whether the survey, cover letter, and data collection procedure designs, based on the literature review and discussion group, would produce a high response rate.

METHOD

QUESTIONNAIRE DESIGN

The questionnaire content was determined through collaboration between Centers for Disease Control and Prevention (CDC) and Battelle investigators, and included multiple meetings to determine the main constructs to measure as well as the items to measure them. The initial instrument was pilot tested with nine physicians, and revisions were made based on their comments. The final questionnaire was 21 pages and contained main sections that measured (a) physician and practice characteristics, (b) STD diagnosis practices and experience, (c) STD treatment and control practices, and (d) opinions about STD reporting requirements and partner notification. Questions were designed and the survey was formatted to maximize ease of completion and to minimize any calculations or estimations the physician needed to make. A study logo was designed and placed on the survey cover sheet along with a brief description of the research aims and how the survey information would be used. The CDC was prominently listed as the organization responsible for the study.

A short cover letter briefly described the purpose of the survey, how the sample of physicians was selected, confidentiality assurances, and why each physician's response was essential. A longer information sheet providing more detail about the study was also included. Thus, the physician respondent could quickly obtain essential information from the cover letter or could read more detail if he or she chose to do so.

STUDY DESIGN

The design for the response rate study was a three (incentive amount) × 2 (delivery mode) factorial design. The three incentive amounts used in the study were $0, $15, and $25. The $0 condition was included to provide a baseline group to compare with the monetary incentive groups. The two delivery methods were FedEx and first class U.S. mail.

SAMPLE

The sample was purchased from a supplier of the American Medical Association (AMA) Masterfile. The vendor constructed a sampling frame consisting of all physicians in the AMA Masterfile who (a) indicated that they spend the majority of their professional time on direct patient care, and (b) listed primary specialties of obstetrics/gynecology, family or general practice, emergency medicine, pediatrics, or general internal medicine. The sampling frame was restricted to these five specialties because they account for 85% of all STDs diagnosed (Hammett et al., 1997). To exclude internists who practiced in a subspecialty, we requested that the vendor include only general internists who did not specify a secondary specialty. Physicians who listed a post office box for a mailing address were also deleted from the sampling frame because FedEx does not deliver to them. A simple random sample of 300 physicians was selected from this sampling frame.

DATA COLLECTION PROCEDURES

The 300 physicians in the sample were randomly assigned to the six delivery by incentive study conditions and assigned identification numbers for tracking purposes. Thus, 50 physicians were assigned to each study condition. All sampled physicians were sent a survey packet containing the questionnaire, cover letter, information statement about the study, and a postage-paid return envelope. The packets were sent by FedEx or first class mail, depending on the physician's assigned delivery mode condition. Those physicians who were assigned to the $15 and $25 conditions were sent packets that included cash payments of the appropriate amount. One third of physicians received no cash incentive.

During the first few days after the mailing, 11 physicians were found to be not locatable (the packets were returned as undeliverable), deceased, or ineligible. These physicians were replaced by 11 additional physicians randomly selected from the sampling frame and questionnaire packets were sent to them. Reminder postcards were sent to all physicians in the sample 1.5 weeks after the initial mailing. All physicians who had not returned a questionnaire 4 weeks after the initial mailing were sent, by their assigned delivery mode, a duplicate questionnaire with a cover letter reminding them of the survey and asking them to complete the questionnaire. Reminder telephone calls were made to physicians who did not return a questionnaire 6 weeks after the initial mailing. In most cases, a reminder message was left with the physician's office staff. A final survey mailing was sent by certified mail to all physicians who had not completed the survey 8 weeks after the initial mailing.

RESULTS

Table 1 presents the distribution of physician specialties in the total sample of 311 physicians. This physician specialty distribution is approximately what would be expected based on AMA statistics, with

TABLE 1
Number of Physician Specialties in Sample

Physician Specialty	N	%
Family medicine	126	40.5
General practice	4	1.3
Internal medicine	7	2.3
Obstetrics/gynecology	47	15.1
Pediatrics	92	29.6
Emergency medicine	35	11.3
Total	311	100.0

TABLE 2
Final Dispositions of Physicians Sampled

Final Disposition	N	%
Deceased or retired	7	2.3
Not locatable	11	3.5
Ineligible	15	4.8
Completed survey	158	50.8
Partially completed survey	5	1.6
Refused or no response	115	37.0
Total	311	100.0

the exception of the general internists. Only 7 general internists were included in the sample, yet the AMA statistics indicate that approximately 20% of the sample should have been general internists. Thus, general internists are greatly underrepresented in the sample. It was determined that this was because of an error in the procedures used to select general internists who have no secondary specialty.

Table 2 presents the final return rates of all 311 physicians who were sent a survey. Seven surveys (2%) were returned with an indication that the physician was deceased or retired. Eleven surveys (4%) were undeliverable because of a bad address, and follow-up efforts to identify a new or correct address were unsuccessful. An additional 15 physicians indicated that they were not eligible to participate in the study because of being on leave from the office, not providing direct patient care, or not seeing patients between the ages of 13 and 60. Thus, a total of 33 physicians, accounting for 11% of the sample, were ineligible or unreachable. A total of 158 physicians completed and returned the survey. Excluding physicians who were ineligible or unreachable from the denominator, the overall response rate was 58.6%.

Table 3 presents the cumulative response rates for the six delivery modes by incentive conditions, after each point of contact with the physicians. Because the reminder postcard was sent shortly after the first mailing, responses received after the postcard may be late responses to the first mailing. A two-way analysis of variance tested the effects of incentive amount and mode of delivery on final response.[1] There was a significant main effect for mode of delivery ($F = 4.1$, $df = 1$, $p < .05$) with physicians who received the survey by FedEx being more likely to respond than physicians who received the survey by first class mail (61% vs. 53%). There was also a main effect for incentive amount ($F = 28.2$, $df = 2$, $p < .01$), with physicians receiving an incentive being more likely to respond than physicians receiving no incentive (70% vs. 27%). The two-way interaction was not significant.

We also conducted cost analyses to compare the cost effectiveness of delivery modes and of incentive amounts. The cost analysis of delivery modes was restricted to include only physicians who received an incentive, because their response was much greater than the physicians who received no incentive. The mailing cost to send out each packet by first class mail was $1.24 and by FedEx was $3.45. The cost to send questionnaire packets by certified mail was $2.59. Table 4 lists the total number of surveys sent by first class mail and by FedEx and the total mailing cost at each mailing. The initial mailing included 8 of the 11 replaced physicians. The postcard reminder mailing costs are not included, because postcards were sent to all physicians sampled so the cost did not vary by delivery mode. Second mailing and certified mailing numbers assume that all undeliverable and ineligible physicians had been identified and were excluded from the mailings. The last three columns in Table 4 show the total mailing cost, the number of respondents, and the cost per response for each delivery mode. The cost per response of first class mail ($4.95) is about two thirds the cost per response of FedEx ($7.69). These costs do not include labor for the mailings or for the telephone follow-up. If these were included, the per response difference in cost would be smaller, because FedEx required fewer follow-up mailings and phone contacts because of the higher response at each contact point.

Because FedEx produced a higher response than first class mail, we restricted our incentive condition cost analysis shown in Table 5 to

TABLE 3
Cumulative Response Rate by Delivery Mode and Incentive Amount

			Contact Attempt									
	Study Condition		*Initial Mailing*		*Postcard Mailing*		*Second Mailing*		*Reminder Phone Call*		*Final Mailing*	
Delivery Mode	*Incentive ($)*	*Denominator*[a]	%	N	%	N	%	N	%	N	%	N
First class	0	*N* = 42	2.4	1	11.9	5	16.7	7	21.1	9	28.6	12
	15	*N* = 49	32.7	16	49.0	24	55.1	27	61.2	30	67.3	33
	25	*N* = 47	25.5	12	38.3	18	48.9	23	53.2	25	59.6	28
Fed Ex	0	*N* = 48	10.4	5	10.4	5	18.8	9	20.8	10	27.1	13
	15	*N* = 45	46.7	21	57.8	26	75.6	34	75.6	34	75.6	34
	25	*N* = 47	46.8	22	57.4	27	74.5	35	76.6	36	80.9	38

A. Denominator is the number of possible respondents after subtracting those determined to be ineligible or undeliverable.

those physicians who were in the FedEx study condition. We computed a total incentive cost for the 45 physicians who were in the $15 condition and for the 47 physicians who were in the $25 condition. These totals were then divided by the number of respondents to obtain an incentive cost per response. Undeliverable and ineligible physicians were excluded from these computations since these incentive payments were recovered. The $15 incentive resulted in a cost of $19.85 per response, whereas the $25 incentive resulted in a cost of $30.92 per response.

DISCUSSION

High response to physician surveys is crucial for obtaining valid information about clinical practice. Many survey features and procedures have been identified as important in improving response. These include provision of a monetary incentive and use of delivery methods that will get the physician's attention. However, there is no current information about the optimal incentive amount, nor has there been any study on the effect of courier service delivery. This study provides crucial information about these two factors in increasing physician response to surveys.

As expected, we found that provision of a monetary incentive resulted in much greater response than no incentive. We found that the mode of delivery had virtually no effect on response when no monetary incentive is provided, possibly because the lack of an incentive resulted in a very low response (about 27%). However, among physicians who were provided a monetary incentive, FedEx delivery resulted in a higher response rate than first class mail. The highest response rate (81%) was obtained from physicians who received $25 enclosed with the survey sent by FedEx. Physicians who were sent the survey by FedEx with $15 enclosed had a response rate only 5% lower (76%). These findings suggest that the provision of a monetary incentive (either $15 or $25 vs. $0) is of greater importance than delivery mode in maximizing response.

This study also found that the effect of the various follow-up contact procedures varied by study condition. Among physicians who were sent the survey by first class mail, each follow-up contact appears useful in improving response. Each contact resulted in an increase in the

TABLE 4
Delivery Mode Cost Analysis

	Contact Attempt								
	Initial Mailing		*Second Mailing*		*Final Certified Mailing*				
Delivery Mode	N	*Cost ($)*	N	*Cost ($)*	N	*Cost ($)*	*Total Cost*	*No. of Respondents*	*Cost per Response*
First class	103	128	55	68	41	106	302	61	$4.95
FedEx	105	362	39	135	22	57	554	72	$7.69

NOTE: Table includes only physicians who were given monetary incentives.

TABLE 5
Incentive Condition Cost Analysis

Incentive Condition	*Total Cost ($)*	*No. of Respondents*	*Cost per Response ($)*
$15	675	34	19.85
$25	1,175	38	30.92

NOTE: Table includes only physicians who were sent the survey via FedEx..

response rate of at least 4%. This finding is congruent with Dillman's (1978) recommendation that multiple follow-up contacts maximize response to mailed surveys. Physicians who were sent the survey by FedEx with no incentive obtained a similar pattern except that the postcard and the reminder telephone call had little impact. By contrast, physicians who were sent the survey by FedEx with a monetary incentive achieved nearly their maximum response rate after the second mailing. The telephone call and the final mailing had no effect on physicians who received $15 by FedEx and had a very small effect on response among the physicians who received $25 by FedEx.

The $15 and $25 incentives sent by FedEx resulted in a higher response rate immediately after the first mailing (47%) than any of the other study conditions. The postcard reminder resulted in nearly 60% response and the second mailing led to 75% response for both of these conditions. Clearly, the higher response rate early in the data collection process for these two study conditions results in lower follow-up labor costs than the other study conditions.

Our cost analysis found that the cost per response of sending the survey by FedEx is only slightly greater than the cost per response of first class mail ($7.69 vs. $4.95). This difference would be less if follow-up labor costs had been included in the cost analysis. Thus, it is clear that there is a distinct advantage to sending the survey by courier service.

It is also clear from our study findings that a monetary incentive should be provided with the physician survey. Our highest response rates were obtained with $15 and $25 incentives sent by FedEx. However, the difference in response rate obtained by these two incentives was only 5%. It is not clear whether an additional 5% response is worth spending $25 per sampled physician when both incentive amounts resulted in very good response. Obviously, higher response rates provide greater confidence in the validity and reliability of the survey measures. However, budgetary factors also need to be considered. The national survey, for which this pretest was conducted, surveyed 7,300 physicians. The difference in incentive costs of providing a $25 incentive rather than a $15 incentive is $70,000. It was necessary to determine whether 76% response expected from using a $15 incentive would be adequate, or whether an additional 5% response is worth this additional cost. Obviously, other investigators will need to make similar decisions after considering the sample size, expected response rates, and incentive costs and their budget.

This study provides important information about the effects of delivery mode and incentive amount on physician response to a mailed survey. It is clear that courier service delivery is preferable over first class mail. This may be because of the relative novelty of the courier service in getting the physicians' attention. Thus, if many surveys are sent by courier service, this effect may diminish. We also demonstrated the importance of providing a monetary incentive with the survey. An important limitation of this study is that we investigated only the effects of two monetary amounts. We do not know whether a smaller incentive would have produced as high a response as our $15 condition, or whether a larger incentive may have resulted in much greater response than our $25 condition. Additionally, we do not know how generalizable these findings are. It is possible that different incentive amounts will be necessary for surveys of different lengths or surveys that are concerned with other topics.

NOTE

1. Analysis of variance was used since binomial outcome distributions can be approximated by the standard normal distribution when the sample size is at least 15 (Edwards, 1972).

REFERENCES

Asch, D. A., Christakis, N. A., & Ubel, P. A. (1998). Conducting physician mail surveys on a limited budget. A randomized trial comparing $2 bill versus $5 bill incentives. *Medical Care*, *36*(1), 95-99.

Asch, D. A., Jedrziewski, M. K., & Christakis, N. A. (1997). Response rates to mail surveys published in medical journals. *Journal of Clinical Epidemiology*, *50*(10), 1129-1136.

Berk, M. L., Edwards, W. S., & Gay, N. L. (1993). The use of a prepaid incentive to convert nonresponders on a survey of physicians. *Evaluation & the Health Professions*, *16*(2), 239-245.

Berry, S. H., & Kanouse, D. E. (1990). Physician response to a mailed survey: An experiment in timing of payment. *Public Opinion Quarterly*, *51*, 102-116.

Choi, B. K., Pak, A. W., & Purdham, J. T. (1990). Effects of mailing strategies on response rate, response time, and cost in a questionnaire study among nurses. *Epidemiology*, *1*, 72-74.

Church, A. H. (1993). Estimating the effect of incentive on mail survey response rates: A meta-analysis. *Public Opinion Quarterly*, *57*, 62-79.

Deehan, A., Templeton, L., Taylor, C., Drummond, C., & Strang, J. (1997). The effect of cash and other financial inducements on the response rate of general practitioners in a national postal study. *British Journal of General Practice*, *47*(415), 87-90.

Dillman, D. A. (1978). *Mail and telephone surveys*. New York: John Wiley.

Edwards, A. L. (1972). *Experimental Design in Psychological Research*. New York: Holt, Rinehart & Winston.

Everett, S. A., Price, J. H., Beddell, A. W., & Telljohann, S. K. (1997). The effect of a monetary incentive in increasing the return rate of a survey to family physicians. *Evaluation & the Health Professions*, *20*, 207-214.

Fox, R. J., Crask, M. R., & Kim, J. (1988). Mail survey response rate: A meta-analysis of selected techniques for inducing response. *Public Opinion Quarterly*, *52*, 467-491.

Hammett, T. M., Kaufman, J. A., Faulkner, A. H., Hoaglin, D. C., Battaglia, M. P., Felsenstein, D., & Blumenthal, D. (1997, May 1). *Sexually transmitted disease (STD) prevention in the United States: Integrated evaluation of public and private sector disease reporting and service delivery.* CDC No. 200-93-0633, Phase I Final Report.

Harvey, L. (1987). Factors affecting response rates to mailed questionnaires: A comprehensive literature review. *Journal of Marketing Research*, *29*(3), 341-353.

Maheux, B., Legault, C., & Lambert, J. (1989). Increasing response rates in physicians' mail surveys: An experimental study. *American Journal of Public Health*, *79*, 638-639.

Mullen, P. D., Easling, I., Nixon, S. A., Koester, D. R., & Biddle, A. K. (1987). The cost-effectiveness of randomized incentive and follow-up contacts in a national mail survey of family physicians. *Evaluation & the Health Professions*, *10*(2), 232-245.

O'Connor, A. M., Llewellyn-Thomas, H. A., Sawka, C., Pinfold, S. P., To, T., & Harrison, D. E. (1997). Physicians' opinions about decision aids for patients considering systemic adjuvant therapy for axillary-node negative breast cancer. *Patient Education and Counseling*, *30*(2), 143-153.

Tambor, E. S., Chase, G. A., Faden, R. R., Geller, G., Hofman, K. J., & Holtzman, N. A. (1993). Improving response rates through incentive and follow-up: The effect on a survey of physicians' knowledge of genetics. *American Journal of Public Health*, *83*(11), 1599-1603.

Thran, S. L., & Berk, M. L. (1993). Survey of physicians: An overview. In: Proceedings of the International Conference on Establishment Surveys. Alexandria, VA: American Statistical Association.

Wilkins, J. R., Hueston, W. D., MacCrawford, J., Steele, L. L., & Gerken, D. F. (1997). Mixed-mode survey of female veterinarians yields high response rate. *Occupational Medicine*, *47*(8), 458-462.

Yammarino, F. J., Skinner, S. J., & Childers, T. L. (1991). Understanding mail survey response behavior: A meta-analysis. *Public Opinion Quarterly*, *55*, 613-619.

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National Survey of US Physicians' STD Screening, Testing, Case Reporting, Clinical and Partner Notification Practices

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Abstract

Objectives: Health care has changed markedly since the last national survey of physician's STD practices in 1968. More current information is needed to inform STD prevention and control efforts in the US.

Methods: Surveys were mailed to a random sample of 7,300 physicians to assess STD screening, testing, reporting, and partner notification for syphilis, gonorrhea, chlamydia, and HIV.

Results: Less than 1/3 routinely screened men, non-pregnant, or pregnant women for STDs. Case reporting was lowest for chlamydia (37%), intermediate for gonorrhea (44%) and higher for syphilis, HIV, and AIDS (53%-57%). Physicians expected patients to do partner notification, instructing them to notify their partners (82%-89%) or to self-notify the health department (25%-34%).

Conclusions: Implications for STD control and prevention are discussed.

National Survey of US Physicians' STD Screening, Testing, Case Reporting, Clinical and Partner Notification Practices

More than 15 million sexually transmitted diseases (STDs) occur annually in the US. [1,2] Rates of curable STDs in the US also are the highest in the developed world and higher than in some developing countries.[1,2] STDs account for 87 percent of the diseases most frequently reported to public health authorities in the US (CDC, 1996) and of the ten most frequently reported diseases, five are STDs.[2,3] The economic burden of STDs associated with both direct and indirect costs is also substantial. In 1994 dollars, the total cost for selected common STDs and their sequelae is estimated to be $10 billion annually.[2]

Federal resources for the control and prevention of STDs are largely distributed to state and local health departments that have, for more than fifty years, provided disease surveillance, screening of at-risk individuals, partner contact tracing, and STD clinics that offer a safety net for medically underserved populations. The science base that informs STD control and prevention in the US is generated primarily from research conducted in these publicly funded STD clinics. However, recent evidence suggests that most STD care in the US takes place in the private sector. The National Health and Social Life Survey, a population-based household survey, revealed that STDs are frequently treated in private practice settings. Almost three-quarters (71%) of the respondents diagnosed with an STD in the previous year had received their care from a private practice, community health center clinic, emergency room, or family planning clinic rather than from a publicly funded STD clinic. Only 5% said they were treated in an STD clinic. The remaining 24% received their STD care in a variety of settings "other" than those mentioned above. [4]

Relatively little is known about current STD practices outside of dedicated STD clinics. Although some small regional studies have been reported, the last national STD survey of physicians was in 1968 and was very limited in its scope since it contained only two questions (number of STD cases that physicians diagnosed and reported to public health departments).[5] The health care climate has changed markedly since that time with shifts toward managed care and advances in STD diagnostics and treatment.[6] In addition, dwindling resources have closed or limited the hours of operation of publicly funded clinics in several geographic areas, raising concerns that financial constraints might contribute to increasing prevalence of treatable STDs.

This paper presents results from a national survey of US physicians that assessed screening, case reporting, partner management, and clinical practices for syphilis, gonorrhea, chlamydia, and HIV infection.

Methods

Procedures

Five medical specialties were selected based on evidence that they provide care for 85% of STDs diagnosed in the US.[7, 8] Surveys were mailed to a randomly selected sample of 7,300 physicians from the American Medical Association's Physician Master File. The Physician Master File was used for the sampling frame since it includes all US medical school graduates, provides a more unbiased sample of physicians than the AMA Membership File, and is the most comprehensive national list of physicians. Inclusion criteria were physicians who reported that they (1) specialized in obstetrics/gynecology, internal medicine, general or family practice, emergency medicine, or pediatrics; (2) spent at least 50% of their professional time in direct patient care; and (3) cared for patients between the ages of 13 and 60.

Each survey included a cash incentive of $15.00, a postage-paid return envelope, and was sent by Federal Express. A reminder postcard was mailed ten days later and repeat surveys were sent to non-respondents 4, 7, and 15 weeks after the initial mailing. The study was reviewed and approved by the Institutional Review Boards at CDC and Battelle and by the federal Office of Management and Budget (OMB). A letter enclosed with the survey explained that the return of a completed survey constituted consent for research participation.

The cumulative response rate was 70.2% after adjusting for surveys that were undeliverable or returned as ineligible. Completed surveys (N=4,226) were received from all 50 states and the District of Columbia, with approximately equal regional distribution (northeast -21%, south - 32%, mid west - 25%, and west -22%. Less than 9% of the original sample disqualified themselves because they did not see enough STDs in their practices.

Sample

Mean age of the physicians who completed the survey was 46.2 (SD=10.3) years and 72% were male. Most of the sample was white (81%), with few Asian (13%), African-American (4%), and Native American or Hawaiian/Pacific Islander physicians (less than 1%). Five percent of the sample was of Hispanic or Latino ethnicity. On average, these physicians had been in practice 17.8 (SD=10.5) years, spent 42.6 (SD=16.4) hours a week in direct patient care, and saw 98.1 (SD=72.1) patients per week.

Most worked in private practice settings (87%) although 13% were in publicly funded settings such as the military, correctional care, veteran's facilities, public health departments, or community health centers. Less than 1% practiced in dedicated STD clinics. Physicians' work settings included solo practices (24%), single-specialty group practices (45%), multi-specialty group practices (20%), staff model Health Maintenance Organizations (HMO) or other Managed Care Organizations (6%), and other types of office practices (5%). The communities in which their practices were located were equally distributed between urban cities greater than 250,000 residents (25%), suburban communities and cities with 100,000 to 250,000 residents (28%), smaller cities of 25,000 to 100,000 residents (24%), and small towns and rural areas (23%).

The majority of the sample (77.6%, N=3,239) diagnosed and treated sexually transmitted diseases in their practice within the past year. The percentage of physicians who reported having diagnosed each disease in the past year was syphilis (18.8%), gonorrhea (53.8%), chlamydia (73.4%), and HIV (23.6%).

Results

Screening Practices

STD screening was examined separately for the total sample and for those who diagnosed each STD within the past year. As shown in Table 1, physicians who see male patients rarely screen for syphilis, HIV, gonorrhea or chlamydia, despite the frequently asymptomatic nature of these diseases in males. Screening of non-pregnant women ranged from 20% to 35% of physicians. Not surprisingly, a higher percentage reported screening pregnant women, approximately one-third of physicians (30-32%). Similar to the total sample, the percentage of physicians who diagnosed STDs in the past year ranged from 15% for chlamydia to 27% for HIV. The percentage of physicians screening non-pregnant women was slightly higher for physicians who treated STDs in the last year, ranging from 22% to 40%. The percentages of physicians screening pregnant women were five to six percent higher for those who had recently diagnosed STDs in their practices, ranging from 36% for gonorrhea to 39% for syphilis.

Screening for STDs is of special importance in the care of pregnant women. Since most obstetricians/gynecologists can be assumed to provide prenatal care, we separately examined screening practices by obstetrician/gynecologists (N=661). This information is included in Table 1. Obstetricians' screening of non-pregnant women ranged from a low of 23% for syphilis to a high of 55% for chlamydia. The percentage of obstetrician/gynecologists who screened pregnant women was higher for all four diseases (78% - 87%), although still below the universal screening of pregnant women that is recommended in the 1998 Guidelines for Treatment of Sexually Transmitted Diseases and the Guide to Clinical Preventive Services.[11,12]

Case Reporting

Table 2 presents physicians' knowledge of disease reporting requirements in their states, their frequency of reporting, beliefs about whether reporting was done by their laboratories, and attitudes about whether case reporting is a worthwhile activity. Analyses of physicians' reporting practices for chlamydia and HIV were adjusted to include only those physicians who practiced in states where chlamydia or HIV reporting was legally mandated and, for each disease, included only physicians who reported diagnosing that specific disease within the past year in each analysis.

A substantial proportion of the sample was uncertain as to whether reporting was required from either physicians or laboratories (23% to 49% depending on disease). The frequency of case reporting was lowest for chlamydia (37% in states where chlamydia reporting was required), intermediate for gonorrhea (44%) and highest for syphilis, HIV, and AIDS (53% to 57% in states where required). A larger percentage of physicians believed that HIV and AIDS reporting are very worthwhile (60%) compared to the other diseases (39% to 53%). The same proportion report HIV and AIDS, yet it is worth noting that about 40% stated that they never report HIV or AIDS diagnoses to public health authorities. Although 38% to 49% were uncertain whether laboratories were required to report positive tests to the health department, 72% to 86% assumed their laboratories were doing so.

Partner Notification and Clinical Actions

Table 3 lists patient management actions, actions to prevent partner infection, and public health actions related to infection control that physicians might take when they diagnose a STD. The table lists the percentages of physicians who indicated that they "always" take each action for each STD.

Few physicians always refer patients with gonorrhea, chlamydia or syphilis elsewhere for medical management (7% - 12%), but nearly 60 percent routinely refer patients with HIV elsewhere for treatment and management. Over half of physicians presumptively treat gonorrhea and chlamydia and nearly 40% do so for syphilis.

The most common infection control strategies are patient counseling (tell patient to remain abstinent or to use condoms) and encouraging patients to inform their sex partners to seek treatment (80% to 89%). Only a minority of physicians (20% to 30%)

ascertains whether their patients did refer partners for diagnosis and treatment. Physicians rarely give medication to the patient to deliver to their sex partners (a practice which is not allowed in some states) or collect information about the patient's partners and contact them directly (4% to 7%).

The most common public health action is to report the patient's name to the health department. This is done more often for syphilis and HIV (50%) than for gonorrhea and chlamydia (38% - 44%). One quarter (chlamydia and gonorrhea) to one-third (syphilis and HIV) of physicians instruct patients to self-notify the health department of their diagnosis and provide the health department with partner information. Only 9% to 16% of physicians obtain information about partners and send this information to the Health Department.

Use of Newer Diagnostic Tests

For the items assessing physicians' preferred diagnostic tests, response alternatives ranged from 'never use' to 'always use' on a five-point scale. Table 4 presents the percentage of physicians who indicated they 'always' used a given test. Preferences of physicians with and without recent STD diagnosis experience were compared, but did not differ. As shown in Table 4, physicians who tested for either gonorrhea or chlamydia were most likely to be using DNA probe (gonorrhea, 36%; chlamydia, 42%) or laboratory culture (gonorrhea; 31%; chlamydia, 18%). Clinicians rarely used the newer and more sensitive (PCR/LCR) urine based nucleic amplification tests (1.3% for gonorrhea; 1.8% for chlamydia).

The DNA probe test is easier to implement clinically for females because pelvic examinations and vaginal/cervical swabs are accepted clinical practices during women's reproductive health care visits. Few physicians screen males, but it is possible that the clinicians who reported that they screen males might be more likely to use urine tests. This was examined separately, but did not reveal markedly different patterns of test use.

Discussion

These results provide an updated view of current STD practices in the US with important implications for public health policy and practice, clinical practice, and medical education. They confirm that substantial STD care is provided outside of dedicated STD clinics; hence, physicians in community-based practices are essential links in partner management and public health surveillance.

Physicians' encounters with syphilis and HIV appear to be higher than would be expected from current surveillance data and several possible interpretations suggest themselves. One possibility is that the burden of disease is considerably higher than current surveillance estimates. Another is that respondents may have equated previously diagnosed cases with incident infection. In addition, physicians who felt they did not see STDs self-selected out of the survey.

This study documents considerable diversity in how physicians handle STD screening, testing, case reporting, and partner notification. Therefore, programs that intend to impact on the care that they provide will need to take into consideration this diversity and the factors that underlie it. No single intervention will be equally appropriate for all physicians. STD prevention and control is widely dispersed across a variety of practice settings and will require linkages between health departments and private physicians for optimal results.

The prevalence of STD screening was surprisingly low for men and for non-pregnant women, as was the percentage of physicians who screen pregnant women. Although the percentage of obstetrician/gynecologists who screened pregnant women was higher, it was still lower than the recommendations in standard practice guidelines, such as the STD Treatment Guidelines or the Guide to Clinical Preventive Services, that all pregnant women should be screened.[11,12]

Community based physicians play an important role in case finding and reporting, but these behaviors are less frequent than might be assumed by public health authorities. From 23% to 49% of physicians lacked awareness of reporting requirements for either clinicians or laboratories. Twenty years ago, a smaller survey of physicians in New York State found that only about 30% to 37% knew which diseases they were required to report.[19] This current survey reflects little improvement in providers' knowledge of reporting requirements in the intervening years.

Reporting has improved since the last survey in 1968 when only 19% of physicians reported infectious syphilis and 30% of physicians reported gonorrhea.[5] However, reporting remains well below optimal levels or state mandated requirements. Policy level interventions to increase case reporting may be beneficial. Further research to better clarify facilitators and barriers to case reporting could inform the development of interventions to improve case reporting practices. Given the heavy reliance on laboratory reporting by many physicians, studies to document the actual reporting behavior of laboratories are essential to justify physicians' dependence on this strategy.

Physicians treated presumptively about half the time for gonorrhea and chlamydia (56.7% for gonorrhea; 54.2% for chlamydia; and surprisingly almost 40% do so for syphilis. This has implications for disease surveillance since presumptive treatment may not be accompanied by confirmatory diagnostic tests and physicians are relying on their laboratories to report cases. In addition, according to CDC case definitions, presumptive diagnoses based only on clinical signs and symptoms are not reportable by physicians. [11]

The newer urine screening diagnostic tests are rarely used by community based physicians although these tests are less invasive, more acceptable to patients, allow screening to be conducted in nontraditional settings, and are easier to implement for both men and women.[20] Failure to use the newer testing technologies may be related to higher cost.

The results of this survey suggest there are many missed opportunities to diagnose, treat, or prevent sexually-transmitted diseases in the US.[13] Another survey of primary care physician found that only 49% reported that they asked their adult patients about STDs.[14] Another national survey reported that only 40% of internal medicine physicians asked patients about sexual behaviors.[15] Together, these data suggest there are many lost opportunities to reduce the STD burden in the US. While consistent screening could compensate for the infrequency of taking a sexual history, rates of screening reported in this survey were insufficient to fill the gap.

Few physicians engage in partner notification and most instruct patients to self-report to the health department or to notify their partners themselves. This reliance on patient notification represents a gap between common practice and our knowledge of their effectiveness. A better understanding is needed of what patients actually do when they are advised to inform their partners or the health department of their STD infection.

This study has several limitations. First, there may be an implicit sample bias if physicians who saw STDs were more likely to return the surveys. However, less than 9% of the original sample of 7,300 physicians disqualified themselves because they did not see enough STDs in their practices to respond to the questionnaire. Second, this survey relied upon physician self-report and the accuracy of self-reported information is not known. However, other evidence suggests that physicians overstate their compliance with clinical guidelines and that when physician and patient reports are compared, physicians provide higher reports of adherence to clinical guidelines than do patients.[13, 16-18] This suggests that any inherent bias would be in the direction of over reporting. Finally, this study did not assess whether STDs were more likely to be diagnosed during an initial patient visit. Other research suggests that the frequency of STD discussions differs with new and established patients.[17]

Finally, these data do not reflect a lack of dedication by practicing physicians. Some of the findings may be due to lack of understanding, training, or resources that would allow physicians to more fully address STD issues in their practices. Limited time to counsel or to assess patients' STD risk is another constraint. In addition, some physicians may consider STD to be of lesser concern than other health risks associated with chronic diseases such as smoking or substance abuse. Prioritizing risk may be an even greater issue in managed care settings where providers' time is even more limited than in other practice settings. In addition, some providers may feel that they do not have adequate skills, comfort, or training to conduct sexual histories, diagnose and treat STDs, engage in effective risk reduction counseling, or provide partner services.

Further research to assess these issues and evaluate interventions to overcome barriers to more effective STD control is needed. At a policy level, existing public health mandates clearly are insufficient to accomplish their public health objectives; often providers' are unaware of the legal requirement for case reporting and even when they were aware, were not necessarily following through to report cases. At an institutional level, the findings have clear implications for medical education and continuing medical education programs. At a provider level, additional research to depict the barriers and facilitators that influence screening, presumptive treatment, test utilization, case reporting, and partner services would be helpful and could inform the development of interventions to address these issues. Research to identify alternative methods of gathering sexual history data, such as computerized health histories, would be helpful in identifying alternatives to personal inquiry by the physician. At a community level, research addressing awareness of the need for improved STD control, the importance of timely health care seeking, and compliance with treatment and implementation of partner referral could be useful. In view of physicians' reliance on laboratory reporting, it would also be useful to conduct a parallel survey that focuses on laboratory reporting practices. Finally, repeat administration of this survey could be helpful in providing a "report card" of progress in the future.

References

1. Cates, W & the American Social Health Associate Panel. Estimates of the incidence and prevalence of sexually transmitted diseases in the United States. *STD*, 1999, 26(Supplement), S2 – S7.
2. Eng, TR & Butler, WT (Eds.). *The Hidden Epidemic: Confronting Sexually Transmitted Diseases.* Washington, DC: National Academy Press. 1997.
3. CDC. Ten leading nationally notifiable infectious diseases—United States, 1995. *MMWR*, 1996, 45, 883-884.
4. Brackbill, R, Sternberg, M, & Fishbein, M. Where do people go for treatment of sexually transmitted diseases? *Family Planning Perspectives*, 1999, 3, 10-15.
5. Fleming, W.L., Brown, W.J., Donohue, J, F, & Branigin, P. W. National survey of venereal disease treated by physicians in 1968. *JAMA*, 1970, 11, 1827-1830.
6. Holmes, K. K. Introduction. In Homes, KK, Sparling, FP, Mardh, P-A, Lemon, SM, Stamm, WE, Piot, P & Wasserheit, JN (Eds), *Sexually Transmitted Diseases 3rd Ed.* New York, McGraw Hill, 1999, pp. xxi-xxiii.
7. Hammett, TM, Kaufman, JA, Faulkner, A. et al. *Sexually Transmitted Disease (STD) Prevention in the United States: Integrated Evaluation of Public and Private Sector Disease Reporting and Service Delivery.* CDC 200-93-0633, Phase I Final Report. May 1, 1997.
8. DHHS. 1997. Department of Health and Human Services; National Center for Health Statistics, Data from the National Health Care Survey, 1995: Two Parts: 1) National Ambulatory Medical Care Survey, 2) National Hospital Ambulatory Medical Care Survey.

9. Dillman, DA. *Mail and Telephone Surveys*. New York, NY: John Wiley & Sons. 1978.

10. Kasprzyk, D, Montano, DE, St. Lawrence, JS, & Phillips, WR. The effect of variations in mode of delivery and monetary incentive on physicians' responses to a mailed survey assessing STD practice patterns. *Evaluation and the Health Professions*, 2001, 13, 3-17.

11. CDC. *1998 Guidelines for Treatment of Sexually Transmitted Diseases*. 1998.

12. U.S. Preventive Services Task Force (1996). *Guide to Clinical Preventive Services, 2nd Ed*. Baltimore: Williams & Wilkins.

13. Tao, G, Irwin, K, & Kassler, W. Missed opportunities to assess sexually transmitted diseases in US adults during routine medical checkups. *Am J Prev Med*, 2000, 18, 109-114.

14. Center for Disease Control and Prevention. HIV prevention practices of primary-care physicians—United States 1992. *MMWR*, 1994, 42: 988-992.

15. Schwarz, JS, Lewis CE, Clancy C et al. Internists' practices in health promotion and disease prevention: A survey. *Ann Intern Med*, 1991, 114, 46-53.

16. Montano, DE & Phillips, WR Cancer screening by primary care physicians: a comparison of rates obtained from physician self-report, patient survey. and chart audit. *Am J Public Health*, 1995, 85, 795-800.

17. Boekeloo, BO, Marx, ES, Kral, AH et al. Frequency and thoroughness of STD-HIV risk assessment by physicians in a high-risk metropolitan area. *Am J Public Health*, 1991, 81, 1545-1648.

18. Silverstre, AJ, Gehl, MB, Encandela, J, & Schelzel, G. A participant observation study using actors at publicly funded HIV counseling and testing sites in Pennsylvania. *Am J Public Health*, 2000, 90,1096-1099.

19. Konowitx, PM, Petrossian, GA, Rose, DN. The underreporting of disease and physicians' knowledge of reporting requirements. *Public Health Reports*, 1984, 99, 31-36.

20. Morse, SM, Beck-Sague, CM, Mardh, PA. Issues in the laboratory diagnosis of STDs. In KK Holmes et al (Eds) Sexually Transmitted Diseases, 3rd Ed. New York: McGraw-Hill. Pp.723-734.

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Table 1. STD screening by US physicians, %

	All Physicians Who Treat Males	All Physicians Who Treat Females		OB/GYNs Only	
*Number of physicians	(N=3,509)	(N=4,136)		(N=661)	
Patients	Males	Non Pregnant	Pregnant	Non Pregnant	Pregnant
Syphilis	18.9	19.6	32.0	23.0	84.6
Gonorrhea	13.4	30.0	31.2	50.8	78.5
Chlamydia	12.8	34.7	31.7	54.3	78.2
HIV	24.0	25.6	30.2	34.3	81.4

NOTE 1: Column N's are the number of physicians who saw patients of that gender in their practices

Table 2. Physicians' knowledge, attitudes, and behavior regarding STD case reporting, % (N=4,223)

	Knowledge		Behavior[2]		Knowledge		Belief	Attitude
	Reportable By Physician		Physician Reported		Lab Does Reports		Lab Reports	Reporting Worthwhile
Disease	Agree	Uncertain	Always	Never	Agree	Uncertain	Always	Agree
Syphilis	73.2	23.4	56.0.	35.4	60.5	38.4	85.5	53.2
Gonorrhea	65.3	28.2	44.4	40.8	55.9	41.9	80.3	46.0
Chlamydia[1]	49.8	37.3	36.7	48.4	45.8	49.0	72.0	39.2
HIV[1]	61.6	29.9	56.4	38.3	50.5	45.6	78.7	60.8
AIDS	62.6	29.8	53.4	41.5	48.3	47.2	76.9	59.8

Note 1: Chlamydia and HIV reporting are not required in all states. Reported results for these diseases are based on responses from physicians located in states where chlamydia (N=3,917) or HIV (N=3,101) are reportable.

Note 2: Percentages in the behavior column include only physicians who ever diagnosed the disease (HIV (N=1,454], AIDS [N= 1,973), or syphilis [N=2,473) or treated the disease within the past year (gonorrhea [N=2,178] and chlamydia [N= 2,786])

Note 3: Row percentages within each category do not sum to 100 because some physicians who answered on intermediate points of a 5-point scale are omitted

Table 3. Providers' Partner Notification and Clinical Actions following STD diagnosis, %

Clinical Actions	Gonorrhea	Chlamydia	Syphilis	HIV
Patient Management:				
Treat patient presumptively	56.7	54.2	38.0	---
Refer patient elsewhere for management	6.9	5.4	12.2	58.8
Partner Management:				
Tell patient not to have sex during treatment	79.9	78.5	78.9	---
Tell patient to use condoms	76.2	77.0	76.8	88.0
Tell patient to inform partners of exposure	79.6	79.4	81.3	88.5
Instruct patient to tell partners to seek care for diagnosis & treatment	81.6	80.5	83.5	88.8
Follow-up inquiry whether patient referred partners for treatment	19.7	20.3	23.3	29.5
Collect partner information and have office contact partners	4.1	4.0	4.8	6.8
Give patient medication for partners (Not permissible in all states)	4.3	5.6	3.0	--
Report patient name to Health Department	44.3	38.3	50.4	48.2
Instruct patients to notify Health Department and provide them with partner information	25.2	23.1	29.3	34.0
Send partner information to Health Department	10.6	9.2	14.1	15.8
Note 1: The number of physicians who diagnosed each infection in the last year [gonorrhea and chlamydia] or ever [syphilis and HIV] is the denominator for calculating each column's percentages.	N=2,178	N=2,972	N=2,340	N=1,973

Table 4. Diagnostic tests preferred by physicians who tested patients for gonorrhea or chlamydia in the past year.

	Gonorrhea (N=3,681)	Chlamydia (N=3,635)
DNA probe	36.0	41.7
Laboratory culture	31.2	17.7
Gram stain	9.9	3.1
Urine based PCR/LCR tests	1.3	1.8
EIA-ELISA/DFA	---	5.1
OIA (Biostar™)	---	0.4

Note 1: The percentages for each test are not mutually exclusive since physicians may have indicated consistent use of more than one test. For example they may have indicated that they used gram stain for presumptive diagnosis and DNA probe for definitive diagnosis.

Diagnosis of Sexually Transmitted Diseases by Rural and Non-rural Physicians: A National Comparison of Recent Practices.

Crosby, R.A, St. Lawrence, J.S., Kasprzyk, D., & Montano, D.

In press, *The Health Education Monograph Series*.

Introduction

Among people in the United States, the incidence of sexually transmitted diseases (STDs), including infection with the human immunodeficiency virus (HIV), varies as a function of multiple factors (Eng & Butler, 1997). One important and largely understudies factor is residence in a rural as opposed to a non-rural community. Although STDs are typically more prevalent among people in non-rural communities (CDC, 1999), several studies suggest that STDs may also be an emerging public health problem in rural communities.

Surveillance reports have indicated that STDs and HIV are common in rural as well as non-rural areas of the U.S. (CDC, 1999; Michelson, et al. 1999; Rural Center for AIDS/STD Prevention [RCAP], 1996; Thomas et al. 1999; Valleroy et al. 1998). In the 1990s, rates of syphilis in rural North Carolina counties surpassed those in urban counties of the state (Thomas, Kulik, & Schoenbach, 1995). Surveillance data from the Centers for Disease Control and Prevention have indicated that syphilis, gonorrhea, and chlamydia are common in rural counties throughout the U.S., especially those in the South (CDC, 1999).

Rural HIV infection is also an emerging public health problem. Between 1991 and 1995, AIDS cases increased at a greater rate among Americans living in rural areas than among those living in non-rural or metropolitan areas of the U.S. (CDC, 1992, 1995; RCAP, 1996). As compared with their metropolitan counterparts, rural Americans diagnosed with AIDS were infected at a younger age and were more likely to be infected from heterosexual contact (Sowell & Christensen, 1996; RCAP, 1997). In the South, serosurveillance studies show rates of HIV infection have been approximately equal in rural and metropolitan areas (Young, Feldman, Brackin, & Thompson, 1992; Wasser, Gwinn, & Fleming, 1993).

One important aspect of controlling STD and HIV infection is the diagnosis of existing cases. In the context of rural versus non-rural differences, an important research question is whether the diagnostic practices of rural Physicians differs from those of non-rural Physicians. To the best of our knowledge, published studies have not investigated possible differences in these practices. Accordingly, the current study was designed to compare selected STD/HIV-diagnostic practices between rural and non-rural Physicians. Because previous studies have not been reported, our study was exploratory. We speculated that rural physicians would be less likely than non-rural Physicians to: 1) report diagnosing cases of STD/HIV, 2) screen asymptomatic patients for STD/HIV, and 3) use advanced (e.g., DNA amplification) techniques for the diagnosis of gonorrhea and chlamydia.

Methods

Procedures

Five medical specialties were selected for the survey based on evidence that they provided care for 85% of STDs diagnosed in the U.S. and that the percentage of Physicians from other specialties who treat STDs is small.[7,8] Surveys were mailed to a randomly selected sample of 7,300 Physicians from the American Medical Association's Physician Master File. Inclusion criteria were Physicians who reported that they (1) specialized in obstetrics/gynecology, internal medicine, general or family practice, emergency medicine, or pediatrics; (2) spent at least 50% of their professional time in direct patient care; and (3) cared for patients between the ages of 13 and 60. A pretest of the questionnaire in 1998 informed the design of the final sampling plan and the final 21-page survey. The survey was conducted between May 1999 and January 2000.

Survey methods were developed from Dillman's Total Design Method,[9] a review of physician survey methods research and physician surveys from the past five years, focus group data from Physicians, and Battelle's research experience surveying Physicians.[10] Each survey included a cash incentive of $15.00, a postage-paid return envelope, and was sent by Federal Express to the Physicians' preferred mailing address. A reminder postcard was mailed to all physicians approximately ten days later and repeat surveys were sent to all non-respondents approximately 4, 7, and 15 weeks after the initial mailing.

The study was reviewed and approved by the Institutional Review Boards at CDC and Battelle and by the federal Office of Management and Budget (OMB). A letter was enclosed with the questionnaire that described the study and explained that return of a completed survey would constitute passive consent for research participation.

The response rate was 70.2% after adjusting for surveys that were undeliverable or returned as ineligible due to Physician retirement, Physicians who cared only for patients under age 13 or over age 60, or Physicians not in active practice. Completed surveys (N = 4,226) were received from all 50 states and the District of Columbia, with regional distribution from the northeast [21%], south [32%], mid-west [25%] and west [22%].

Analyses of non-responders showed that Physicians who completed and returned the survey were more likely to be female (28.5% of responders vs. 25.6% of non-responders) and younger (46.2 years for responders vs. 51.2 years for non-responders). Less than 9% of the original sample disqualified themselves from completing the survey because they felt they did not see enough STDs in their practices.

Sample

Mean age of the Physicians who completed and returned the survey was 46.2 (SD = 10.3) years and 72% were male. Most of the sample was white (81%), 13% were Asian, 4% were African-American, and less than 1% were Native American or Hawaiian/Pacific Islander. Five percent of the sample was of Hispanic or Latino ethnicity. On average, these Physicians had been in practice for 17.8 (SD = 10.5) years, spent 42.6 (SD = 16.4) hours a week in direct patient care, and saw 98.1 (SD = 72.1) patients each week.

Measures

Physicians were asked to select the size of the community where their practice was located from a list of eight options (ranging from a community of fewer than 2,500 to large cities of 250,000 or more residents. Several outcome measures were assessed. For example, Physicians reported how many cases of various STDs they had diagnosed in the past year. Specific procedures they used to diagnose two common STDs (chlamydia and gonorrhea) were also assessed. Physicians were also asked about their practices for screening asymptomatic males, females, and pregnant females for various STDs.

Data Analysis

Analyses were conducted using either t-tests for ratio-level data or prevalence ratios for dichotomous data. For example, t-tests were used to compare the mean number of STDs diagnosed by Physicians practicing in rural and non-rural communities (hereafter referred to simply as rural and non-rural Physicians). Alternatively, prevalence ratios, their 95% confidence intervals, and respective *P* values were used to test hypotheses such as whether rural Physicians were more likely than non-rural Physicians to report screening symptomatic patients for selected STDs. Prevalence ratios compare proportions and are not sensitive to sample size; thereby avoiding statistical biases favoring significance that may be an artifact of large sample size. In addition, differences between rural and non-rural Physicians were identified and analyzed as covariates in logistic regression analyses. These analyses yielded adjusted odds ratios and 95% confidence intervals to indicate the strength of association between rural/non-rural Physicians and dichotomous assessments of their practices related to STD diagnosis.

Results

The majority (97.8%; N = 4129) of Physicians who returned questionnaires provided information that allowed us to categorize the size of the community where their primary practice was located. One-third of the Physicians (n = 1376) were categorized as practicing in rural communities (towns of less than 50,000 people). The remaining two-thirds (n = 2753) were categorized as practicing in non-rural communities. Rural and non-rural Physicians reported practicing medicine for approximately equal periods of time (t = 1.82, df = 2561.9, *P* = .07). Differences in the percent of rural and non-rural Physicians practicing as part of a managed organization were observed. Rural Physicians were less likely to practice as part of a managed care organization (PR = .44, 95% CI = .32 - .59, *P* = .0001). Likewise, two differences in the type of practice setting were observed (Table 1). Rural Physicians were significantly less likely to practice in ambulatory clinics of a hospital or medical center and were significantly more likely to report primary care practice. Each of these differences was subsequently analyzed as covariates in the analyses of dichotomous measures STD-diagnostic practices.

Place Table 1 about here

Table 2 displays the mean number of STDs diagnosed in the past year among rural and non-rural Physicians. Rural Physicians were less likely than non-rural Physicians to diagnose syphilis, gonorrhea, and chlamydia. Differences in frequency of diagnosing viral STDs and Trichomoniasis were not observed.

Place Table 2 about here

We also assessed whether Physicians had diagnosed a case of HIV or syphilis in the past two years. Rural Physicians (22%) were less likely to report diagnosing a case of HIV than non-rural (29%) Physicians (PR = .75; 95% CI = .66 - .84, *P* = .0001). Similarly, rural Physicians (16%) were less likely to report diagnosing a case of syphilis than non-rural (24%) Physicians (PR = .66; 95% CI = .57 - .75, *P* = .0001).

Physicians were asked to indicate if they do not screen any patients for STDs. Rural Physicians (45%) were somewhat more likely than non-rural Physicians (40%) to make this indication (PR = 1.13; 95% CI = 1.05 - 1.22; *P* = .002). Remaining Physicians were subsequently asked if they screened asymptomatic patients for STDs. Table 3 displays the percent of rural and non-rural Physicians who reported they did not screen asymptomatic patients for STDs. In bivariate and adjusted analyses, few differences between rural and non-rural Physicians were observed. When differences were observed, rural Physicians were more likely to report they did not screen asymptomatic patients. This difference was primarily found for screening non-pregnant females (syphilis, gonorrhea, chlamydia, and HIV); however, rural Physicians were also less likely to screen males for syphilis.

Place Table 3 about here

The frequency of Physicians' use of diagnostic tests for gonorrhea and chlamydia was also assessed. This assessment excluded Physicians who reported they did not diagnose these STDs. Rural (11%) and non-rural (11%) Physicians were equally likely to report they did not diagnose gonorrhea (PR = .95; 95% CI = .79 - 1.15; *P* = .60). Similarly, rural (12%) and non-rural (11%) Physicians were equally likely to report they did not diagnose chlamydia (PR = .93; 95% CI = .77 - 1.111; *P* = .41).

Table 4 displays the percent of rural and non-rural Physicians who reported infrequent use of selected diagnostic tests for gonorrhea and chlamydia. Only two differences were observed. Rural Physicians were somewhat more likely to report using DNA Probes for both gonorrhea and chlamydia.

Place Table 4 about here

Physicians were asked how often they treated gonorrhea, chlamydia, and syphilis presumptively. Responses were provided on a five-point scale ranging from 0 = "never" to 5 = "always". Rural Physicians were somewhat less likely (M = 3.72) than non-rural Physicians (M = 3.91) to report they treated patients presumptively for gonorrhea (t = 3.36, df = 2,172, *P* = .001). Similarly, rural Physicians were less likely (M = 3.78) than non-rural Physicians (M = 3.92) to report they treated patients presumptively for chlamydia (t = 2.76, df = 2,206, *P* = .001).

Discussion

This study of more than 4000 Physicians indicated that rural Physicians diagnosed bacterial, but not viral or parasitic, STDs less often than non-rural Physicians. Rural Physicians were also less likely to report recent diagnosis of HIV or syphilis. Although these findings were expected, we did not expect to find such remarkable similarity between rural and non-rural Physicians' screening practices for males and pregnant females as well as their relatively infrequent use of various diagnostic tests for gonorrhea and chlamydia, including highly sensitive and specific urine-based DNA amplification methods. Although rural Physicians' were less likely to use DNA Probes for gonorrhea and chlamydia, the magnitude of these differences was small.

Screening procedures of rural Physicians differed from their non-rural counterparts by their greater likelihood of 1) not screening any patients for STDs, 2) not screening females for bacterial STDs and HIV, and 3) not screening males for syphilis. Alternatively, rural Physicians were less likely to report they treated gonorrhea and chlamydia presumptively.

The rather consistent finding that rural Physicians were less likely to screen female patients for bacterial STDs and HIV deserves further study. Like their non-rural counterparts, rural females may benefit from screening for gonorrhea and chlamydia by reduction of risk for Pelvic Inflammatory Disease, salpingitis, and subsequent infertility. Indeed, less frequent screening of females for these STDs may have contributed, at least in part, to the observed lower mean number of gonorrhea and chlamydia cases reported by rural Physicians.

The findings also indicated that, rural Physicians may be less likely to screen females for HIV as well as males and females for syphilis. Although this could be warranted by very low to negligible seroprevalence of these STDs in many rural areas, this practice could also be problematic in rural areas experiencing outbreaks of HIV (MMWR, 1999) or syphilis (CDC, 1999).

The current investigation of rural versus non-rural differences in Physicians' STD-diagnostic practices revealed an interesting finding unrelated to the purpose of the study: A large portion of both rural and non-rural Physicians reported they did not screen pregnant females for syphilis, gonorrhea, chlamydia, or HIV. CDC guidelines specifically state that tests for syphilis, gonorrhea, and HIV should be offered during the first prenatal visit and that a test for chlamydia should be offered during the third trimester (CDC, 1998). The finding that nearly one-half of the Physicians reported not screening pregnant women for these STDs deserves further investigation. Clearly, a substantial portion of those not screening for these STDs may be delivering medical that supplements that given by prenatal care providers.

Findings are limited by several factors. Foremost, data for this analysis was obtained as part of an extensive self-administered questionnaire; the validity of Physicians' responses under this condition is unknown. Further, our choice to define rural communities as towns of 50,000 people or less was somewhat arbitrary. Previous STD-related research has yet to establish a uniform definition of what constitutes a rural area. Our selected cut point of 50,000 was based on a reported analysis from the National Sexual Health Survey (Crosby, Yarber, & Catania, 1999). One problem with any population-based definition of a rural area is that the population of the surrounding communities is ignored. This may be highly problematic when surrounding communities are predominately urban. Finally, the findings are limited by the degree to which our sample represents the study population (U.S. Physicians).

Conclusions

Within the limitations of this study, the findings suggest that rural Physicians diagnose bacterial STDs less often than non-rural Physicians, but their screening and diagnostic practices are very similar. An important exception is that rural Physicians may be slightly less likely to screen asymptomatic females for bacterial STDs and HIV infection.

References

Crosby, R. A., Yarber, W. L., & Catania, J. A. (1999). Condom Use Among Rural Americans: Results From the National Sexual Health Survey: Presented at the First National Convention of the Rural Center for HIV/STD Prevention - "Sharing Successful Strategies". Held in Indianapolis, IN, March 12-14, 1999.

Table 1. Percent of Rural and Non-Rural Physicians By Reported Primary Practice Location (N = 4129)

Location	**Rural**	**Non-Rural**
Primary care office*	77.0	65.0
Ambulatory clinic of hospital or medical center*	7.0	13.0
College or university student health center	< 1.0	< 1.0
Community health clinic	2.5	2.5
Public health clinic	< 1.0	< 1.0
Urgent care clinic	1.5	2.2
Hospital emergency room	8.1	11.4
Family planning clinic	< .5	< .5
Abortion clinic	< .5	< .5
Sexually transmitted disease clinic	< .5	< .5
Institutional setting	1.2	< 1.0
Specialty care clinic	1.2	1.9
Other	< 1.0	1.5

* Significantly different at P < .05.

Table 2. Mean Number of STDs Diagnosed In Past Year Among Rural Versus Non-rural Physicians.

Type of STD	**Rural**	**Non-rural**	***P***
Syphilis	.43 (1306)[a]	.92 (2615)	.004
Gonorrhea	3.88 (1296)	6.30 (2598)	.01
Chlamydia	7.48 (1298)	10.98 (2601)	.004
Human Immunodeficiency virus	1.30 (1322)	1.44 (2639)	.82
Human Papillomavirus	11.03 (1292)	11.07 (2565)	.97
Herpes Simplex virus - type 2	7.67 (1296)	6.47 (2600)	.50
Non-gonococcal urethritis	4.82 (1285)	6.71 (2558)	.18
Trichomoniasis	9.37 (1283)	12.07 (2574)	.06

[a] Numbers in all parentheses represent number of Physicians responding to the survey item.

Table 3. Percent of Rural Versus Non-Rural Physicians Who Reported Not Screening Asymptomatic Patients For Selected STDs*

	Rural %	**Non-Rural %**	**PR**[a]	**95% CI**[b]	***P***	**AOR**[c]	**95% CI**	***P***
STD/type of patient	(n = 730)	(n = 1594)						
Syphilis/males	75	70	1.08	1.02 - 1.13	.008	1.23	1.01 - 1.50	.04
Syphilis/females	71	63	1.13	1.07 - 1.20	.001	1.40	1.16 - 1.70	.0006
Syphilis/pregnant females	45	43	1.05	.95 - 1.16	.34	1.14	.93 - 1.33	.23
Gonorrhea/males	82	79	1.04	.99 - 1.08	.11	1.13	.90 - 1.42	.28
Gonorrhea/females	51	43	1.18	1.08 - 1.29	.001	1.31	1.10 - 1.57	.003
Gonorrhea/pregnant females	45	44	1.02	.93 - 1.12	.67	1.01	.85 - 1.21	.88
Chlamydia/males	82	80	1.02	.97 - 1.07	.39	1.04	.82 - 1.30	.75
Chlamydia/females	43	37	1.16	1.04 - 1.29	.007	1.22	1.02 - 1.47	.03
Chlamydia/pregnant females	44	44	1.00	.91 - 1.11	.92	.98	.82 - 1.17	.84
HSV-2[d]/males	89	91	.98	.95 - 1.01	.11	.80	.60 - 1.08	.14
HSV-2/females	82	83	.99	.95 - 1.03	.55	.99	.79 - 1.25	.96
HSV-2/pregnant females	84	86	.98	.95 - 1.02	.37	.91	.71 - 1.16	.46
HPV[e]/males	91	93	.98	.95 - 1.00	.07	.75	.54 - 1.04	.08

HPV/females	64	68	.95	.89 - 1.01	.08	.88	.73 - 1.07	.21
HPV/pregnant females	73	77	.96	.91 - 1.12	.07	.85	.68 - 1.04	.12
HIV[f]/males	66	63	1.05	.98 - 1.12	.16	1.10	.92 - 1.33	.29
HIV/females	60	52	1.14	1.06 - 1.23	.001	1.35	1.13 - 1.62	.001
HIV/pregnant females	46	47	.99	.90 - 1.09	.85	1.01	.85 - 1.21	.87

* Excludes 45% of rural Physicians and 40% of non-rural Physicians who reported they never screened patients for STDs

[a] Prevalence ratio

[b] Confidence interval

[c] Adjusted odds ratio (adjusted for managed care, primary practice, and practice in a hospital or medical center

[d] Herpes Simplex virus, type 2

[e] Human Papillomavirus

[f] Human Immunodeficiency virus

Table 4. Percent of Rural Versus Non-Rural Physicians Who Reported They Infrequently (50% Or Less Of All Potential Cases) Used Selected Diagnostic Tests For STDs

Diagnostic Test	**Rural %**	**Non-Rural %**	**PR[a]**	**95% CI[b]**	***P***	**AOR[c]**	**95% CI**	***P***
Gonorrhea[d]	(n = 1206)	(n = 2398)						
Gram stain	54	56	.96	.91 - 1.03	.27	.91	.79 - 1.04	.17
Culture	37	37	1.00	.92 - 1.10	.87	.99	.86 - 1.15	.91
DNA Probe	35	31	1.13	1.02 - 1.24	.02	1.22	1.05 - 1.42	.007
Urine PCR/LCR	66	64	1.05	.99 - 1.10	.08	1.16	1.00 - 1.34	.05
Chlamydia[e]	(n = 1030)	(n = 2035)						
~~Gram stain~~	~~90~~	~~91~~	~~.98~~	~~.96 - 1.01~~	~~.79~~	~~1.03~~	~~.89 - 1.19~~	~~.72~~
Culture	56	54	1.04	.98 - 1.12	.23	1.07	.93 - 1.24	.32
DNA Probe	34	30	1.12	1.01 - 1.25	.04	1.22	1.05 - 1.43	.01
Urine PCR/LCR	74	71	1.04	.99 - 1.09	.15	1.13	.98 - 1.31	.10
EIA-ELISA/DFA	68	66	1.02	.96 - 1.07	.54	1.04	.90 - 1.20	.56
OIA (Biostar)	62	62	1.01	.96 - 1.07	.65			

[a] Prevalence ratio

[b] Confidence interval

[c] Adjusted odds ratio (adjusted for managed care, primary practice, and practice in a hospital or medical center

[d] Excludes 11% of rural Physicians and 11% of non-rural Physicians who reported they do not diagnose gonorrhea.

[e] Excludes 12% of rural Physicians and 11% of non-rural Physicians who reported they do not diagnose chlamydia.

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STD Screening by US Obstetricians and Gynecologists: Results from a National Survey.

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Abstract

Background: A national estimate of screening practices by obstetricians and gynecologists would be useful to assess compliance with practice guidelines and to determine the extent of missed opportunities for STD prevention.

Methods: Physicians (N = 7,300) in five specialties that diagnose 85% of STD in the United States were surveyed. Obstetrics and Gynecology (N = 661) was one of the five specialties. Besides providing demographic and practice characteristics, respondents answered questions about who they screen (non-pregnant females, pregnant females) and for which bacterial STDs (syphilis, gonorrhea, chlamydia).

Results: Responding obstetricians and gynecologists were most likely to be non-Hispanic Whites (75%), male (66%), and in their forties (Mode = 43 years old). They saw an average of 90 patients per week during 47 hours of direct patient care. Approximately 95% practiced in private settings. Almost all (96%) screened some patients for at least one STD. No specialty screened all patients, and none screened all pregnant women. However, obstetricians and gynecologists did screen non-pregnant women more frequently than other specialties.

Conclusions: Obstetricians/gynecologists screen women for STDs at a higher rate than other specialties represented in this study. Consistent with published guidelines, most obstetricians and gynecologists in our survey screened pregnant women for chlamydia, gonorrhea, and syphilis. Nonetheless, only about half of obstetricians and gynecologists are screening non-pregnant women for either gonorrhea or chlamydia, and fewer yet screen non-pregnant women for syphilis.

STD Screening by US Obstetricians and Gynecologists:

Results from a National Survey

Bacterial STDs, particularly chlamydia and gonorrhea are the most commonly reportable sexually transmitted diseases (STDs) in the United States.[1] These diseases are frequently asymptomatic in both men and women, thus screening is justified to identify and treat individuals who may be infected, but who do not report or recognize their risk for these highly prevalent, but curable, diseases. Reported syphilis has reached historic lows over the last decade,[2] nevertheless, congenital syphilis cases still occur and can be attributed to inadequate screening.[3,4] However, screening for a low prevalence disease such as syphilis is justified by the high cost and inordinate burden of congenital syphilis. Intensive syphilis screening is also justified by the current effort to eliminate syphilis from the United States[5] because increased screening will be necessary to identify and treat the remaining reservoir of undetected cases. In addition, estimates of national base rates by screening each of these diseases are needed to inform surveillance estimates.[5,6] This paper describes the STD screening practices of US obstetricians and gynecologists who participated in a national survey.

There are many reasons to assess the screening practices of obstetricians and gynecologists. First, the sequelae of many STDs are worse for women than for men. Women are more likely to seek health care and, for many women, obstetricians and gynecologists are their primary provider within the health care system. Every encounter with an obstetrician or gynecologist provides a natural opportunity for STD screening within the context of a prenatal or annual health care visit. Second, women often do not know they are infected, whether due to the asymptomatic presentation of some STDs or failure to recognize symptoms. These untreated STDs may culminate in pelvic inflammatory disease and infertility. Finally, the consequences of untreated STD infections in pregnant women can be dangerous to the fetus and newborn. Thus, screening of pregnant women by obstetricians and gynecologists takes on added importance.[7]

The importance of screening for syphilis, gonorrhea, and chlamydia arises repeatedly in treatment guidelines issued by federal agencies and professional organizations, although the majority of these recommendations are much stronger with regard to screening of pregnant women. The US Preventive Services Task Force (USPSTF) and CDC treatment guidelines recommend screening all sexually active women under age 25 for chlamydia, but offers less guidance about chlamydia screening for all women or for men.[8] Although treatment guidelines typically do not make recommendations for or against screening <u>all</u> women or men, they uniformly stress the necessity of screening pregnant women for STDs, particularly for syphilis. Both the USPSTF and the American College of Obstetricians and Gynecologists recommend screening all pregnant women.[8,9] CDC treatment guidelines recommend universal screening for syphilis, but base screening recommendations for chlamydia and gonorrhea in pregnant women on considerations such as age, history of risk behavior, and prevalence of disease in the geographic area. The peer-reviewed scientific literature is consistent with this recommendation and promotes screening of pregnant women, especially for syphilis.[10,11]

A literature review revealed that most of the screening literature is based on small and local, rather than national, data. Warner et al. found a prevalence of 8.2 congenital syphilis cases per 1,000 live births following 157 chart reviews in Georgia.[12] Schulte et al. reported the prevalence of syphilis among HIV-infected women in Texas and the number of congenital syphilis cases (51%) that followed births to these same women.[13] When Mills et al. asked 96 Minnesota obstetricians and family physicians for their screening endorsements and practices, virtually all physicians (97%) endorsed prenatal screening for syphilis but only one in four endorsed prenatal screening for chlamydia (26%) or gonorrhea (24%).[14] Recurring themes in this research literature include a focus on syphilis rather than other STDs, greater emphasis on screening of pregnant women, and recurring statements about missed opportunities to detect STD. The limitations inherent in these reports of sub optimal screening, assessed primarily for a single STD, and only in local areas argue for the need to conduct a nationally representative survey.

During 1999 and 2000, the Centers for Disease Control and Prevention, in conjunction with the Battelle Centers for Public Health Research and Evaluation, conducted a national survey of U.S. physicians.[15] Five medical specialties (obstetrics and gynecology, internal medicine, general and family practice, emergency medicine, and pediatrics were selected for participation based on evidence that these specialties provide care for 85% of STDs diagnosed in the U.S.[16,17] Further inclusion criteria for participating physicians were that they (1) spent 50% or more of their time in direct patient care, and (2) provided care for patients between the ages of 13 and 60 years. Included in this survey were questions about screening behaviors for syphilis, gonorrhea, and chlamydia. This manuscript addresses three research questions:

(1) What are obstetricans' and gynecologists' current screening practices for syphilis, gonorrhea and chlamydia?

(2) Do these practices differ for pregnant versus non-pregnant women?

(3) How do obstetricians and gynecologists differ from other physicians who see STD in their practices with respect to screening of non pregnant women?

Methods

Procedures

Surveys were mailed by Federal Express to 7,300 eligible physicians selected at random from the American Medical Association's Physician Master File. Each survey included a $15.00 cash incentive and a postage-paid return envelope. A reminder card was mailed ten days after the initial mailing and repeat surveys were mailed to non-respondents 4, 7, and 15 weeks after the initial mailing. After adjustments for surveys marked as undeliverable or returned as ineligible for reasons such as the physicians' retirement, the 4,223 respondents corresponded to a 70.2% return rate. There were minor variations in the return rates from different specialties (64% for internists to 78% for emergency medicine physicians). Overall each specialty was represented within the sample in direct proportion to their representation in the AMA Master File. Of the 4,223 respondents, 90 reported they did not see STDs and were eliminated, leaving 4,133 physicians for analyses. Six hundred and fifty-six reported obstetrics and gynecology as their primary specialty: nine were ineligible due to insufficient time seeing patients, leaving 647 in the final sample of obstetricians and gynecologists.

Data Analyses

Descriptive analyses identified the characteristics of respondents using frequencies for categorical (e.g., practice location) variables and means for continuous variables. Obstetricians and gynecologists were compared to physicians in the remaining four specialties with chi-squared tests, using phi coefficients to estimate effect sizes for differences. The phi coefficient approximates the correlation coefficient for nominal data, such as the differences in screening patterns. Differences in screening rates for pregnant versus non-pregnant women by obstetrician/gynecologists were assessed using McNemar's chi-square for related samples, a non-parametric equivalent to repeated measures tests for continuous variables.

Results

Descriptive Characteristics of US Obstetricians and Gynecologists and their Practices

Table 1 presents descriptive data for the 647 obstetricians and gynecologists who responded to the survey and who fit the eligibility criteria. About two-thirds of physicians were male and the modal practitioner was 43 years old with 18 years of professional experience. The majority either practiced in solo practices (33%) or in single-specialty settings (50%). Eighty percent of the obstetricians and gynecologists who responded to the survey practiced in primary care settings, with most of the remainder practicing in hospital outpatient clinics. Virtually all physicians (94%) reported being in private practice rather than in a publicly funded practice setting. As would be expected, their patients were almost exclusively female (98%). Patients' ages were normally distributed across the lifespan with a plurality falling between 26 and 40 years old.

Screening Practices

Obstetricians and gynecologists. Obstetricians and gynecologists were more likely to screen pregnant women than non-pregnant women for STDs. As shown in Table 2, approximately 80% screened pregnant women for chlamydia and gonorrhea, and about 85% screened pregnant women for syphilis. Screening of non-pregnant women dropped to about one in two women for chlamydia and gonorrhea and to about one in five for syphilis. Each of these differences in proportions (pregnant versus non-pregnant patients, assessed via McNemar's χ^2) was statistically significant. For chlamydia, χ^2 (1) = 99.79; for gonorrhea, χ^2 (1) = 129.52; for syphilis, χ^2 (1) = 381.45, all $p < .001$. Thus, it is clear that obstetricians/gynecologists are far more likely to screen pregnant women than non-pregnant women for STDs.

We also tested whether the number of patients seen per week (an index of patient load) was correlated with screening for any of the three STDs since it is plausible that a high patient load may preclude adequate time for optional measures such as screening. The resulting point-biserial correlations were negative and non-significant, indicating there was no relationship between screening and patient load. Nor were physicians who see a higher proportion of young patients more likely to screen despite the higher prevalence of chlamydia and gonorrhea in adolescents and young adults. Neither the proportion of 13 to 25 year old patients in a practice, nor the absolute number of patients seen in a week correlated significantly with screening for chlamydia, gonorrhea, or syphilis (all $p > .05$).

Obstetricians and gynecologists screened pregnant women for syphilis at nearly the same rates as for chlamydia and gonorrhea. Although a pair wise comparison using McNemar's χ^2 statistic for the chlamydia screening rate (79.4%) versus the syphilis screening rate (85.6%) was significant, χ^2 (1) = 16.18, $p < .001$, the absolute rates are close to one another. The differences are much greater and in the opposite direction when non-pregnant women are concerned, however, for screening of chlamydia (54.6%) versus syphilis (22.9%), χ^2 (1) = 199.04, $p < .001$. Gonorrhea and chlamydia screening rates for non-pregnant women also were similar to one another and the comparison of gonorrhea to syphilis screening was comparable to the comparison of chlamydia with syphilis. Screening of non-pregnant women by obstetricians and gynecologists compared to other specialists. Virtually all (>99%) of the physicians, regardless of specialty, treated women in their practices. Table 2 also compares obstetricians and gynecologists' reports of screening non-pregnant women with those reported by the other four specialties that participated in the survey. Across all three STDs (syphilis, GC, and CT), obstetrician/gynecologists were more likely to screen (23% to 55%, depending on disease) than were other physicians (19% to 31%). No more than 20% to 33% of the physicians in the other specialties that participated in the survey screened non-pregnant female patients for any of the three STDs. Notably, the lowest screening rate for the other specialties was for syphilis (19%). Thus, screening of non-pregnant women appears to be uncommon, despite the frequently asymptomatic nature of these diseases in women and the high long-term costs of undetected infections.

Discussion

Although screening of pregnant women was more common than screening of non-pregnant women, screening of pregnant women was still well below the universal screening recommendations contained in the professional guidelines. It is important to clarify that the percentages in Table 2 reflect the percentage of physicians who reported screening; the proportion of patients who are screened may be lower than the percentages reported in Table 2. (For example, we report that 79.8% of obstetricians and gynecologists screen pregnant women for chlamydia. If this 79.8% screen two-thirds of their pregnant patients, then only about half of the pregnant patients [66.7% of 79.8% = 53.2%] would get screened.) Thus, the figures in Table 2 provide an upper bound estimate for the proportion of patients who are screened.

It is clear that the physicians in this nationally representative sample are less likely to screen non-pregnant females than pregnant females for any STD. Obstetricians and gynecologists certainly screen non-pregnant patients with much more fidelity than do other specialties. However only 22% to 54% of obstetricians, depending upon disease, are screening non-pregnant women. Physicians who participated in our survey, other than obstetricians or gynecologists, are even less likely to screen for bacterial STDs. There may be defensible rationales that explain why physicians should not be encouraged to screen all women for a broad range of STDs. This could well make clinical sense. For example, physicians with older and monogamous clients in a low prevalence setting might easily feel the benefits of screening are not worth the costs (and published guidelines would support that position). On the other hand, since younger women have higher prevalences of chlamydia and gonorrhea, if this were the case, we would expect to see higher rates of screening for these diseases by physicians with younger patients. In this survey, there was no such correlation although given the large sample size, we would have detected even a very small effect (i.e., $r < .10$). Thus it does not appear this type of heuristic is guiding decisions whether or not to screen.

All professional guidelines are consistent in recommending universal screening of pregnant women. The vast majority of obstetricians and gynecologists who participated in this survey were, in fact, screening pregnant women. The findings from this study provide an interesting contrast against the results from a Georgia survey that reported screening rates of 71% (gonorrhea and chlamydia) to 98% (syphilis) for pregnant women.[18] In this nationwide sample, a lower percentage of obstetricians and gynecologists (85%) reported screening pregnant women for syphilis. Despite the relatively high proportion of obstetricians and gynecologists who screened pregnant women for STDs, there is still room for improvement before achieving the recommendations for universal screening of pregnant women.

Clearly, the less frequent screening for syphilis may make clinical sense because syphilis is much less common than the other two STDs. Currently, there are roughly 35 gonorrhea cases and 65 chlamydia cases reported for every case of syphilis.[1] However, given the inordinately high risk to the fetus or neonate of untreated syphilis, even in a low prevalence setting, and in the midst of a national campaign to eliminate syphilis,[5] this is one disease for which universal screening of pregnant women may be well justified. Low screening rates of pregnant women by other specialties may not be problematic so long as pregnant women are routinely referred to obstetricians, who are more likely than not to screen appropriately.

In comparing obstetricians and gynecologists with the other physicians, it should be noted that some of those physicians may practice in settings where screening is not the usual practice standard. Should the differences in screening rates between obstetricians and gynecologists and the other specialties be considered problematic? On the one hand, current practice standards do not encourage routine screening by some specialties, for example emergency room physicians. On the other hand, screening in emergency rooms has identified a substantial number of previously undetected cases.[19,20] Thus, current practice standards that do not encourage STD screening miss many screening opportunities to detect sexually transmitted diseases.

Obviously, there are other control and prevention strategies beyond STD screening of pregnant and non-pregnant women that can be considered to reduce the STD burden in the US. For example, male screening could also disrupt transmission patterns. However, physicians infrequently screen males for STDs. Examination of male screening by the physicians in our sample who saw men in their practices revealed very low rates of STD screening (chlamydia 13%; gonorrhea 14%, syphilis 19%). Thus, men remain a potential reservoir of STD for women, a point that has been made in print at least as far back as 1979.[21] As the USPSTF notes, there is still insufficient information on the efficacy of male screening to guide formal screening recommendations. Clearly, the potential benefits and cost effectiveness of male screening needs further research.

There are a number of limitations to this research. One limitation in the data is only physicians' behaviors can be described. The data do not identify what proportion of patients within a practice is being screened, only that the physician indicated that screening is taking place. The paper also addressed only curable bacterial STDs and did not address screening practice for viral STDs that might well have shown a different pattern of results. Finally, the research relied upon physicians' self-reports of their practice characteristics and clinical behavior. These limitations suggest several avenues for further research. Focusing on patient-level data, including common viral STDs, and assessing the screening practices of other disciplines that provide obstetrical care would be worthwhile.

In conclusion, these results underscore that there are many missed opportunities for STD screening and that the numbers of physicians who are screening both pregnant and non-pregnant women for sexually transmitted diseases are below optimal levels regardless of their practice specialty.

References

1. Centers for Disease Control and Prevention. Tracking the hidden epidemics: Trends in STDs in the United States 2000. U.S. Government Printing Office. Washington: DC, 2001.

2. Centers for Disease Control and Prevention. Primary and secondary syphilis - US 1998. MMWR 1999;48:873-878.

3. Centers for Disease Control and Prevention. Congenital syphilis - US 1998. MMWR 1999;48:757-761.

4. Southwick KL, Guidry HM, Weldon MM, Mertz KJ, Berman SM, Levine WC. An epidemic of congenital syphilis in Jefferson County, Texas, 1994-1995: inadequate prenatal syphilis testing after an outbreak in adults. Amer J Pub Health 1999;89:557-560.

5. Gayle HD, Counts GW. Syphilis elimination: A unique time in history. J Amer Women's Med Assoc 2001;56:2-3.

6. Centers for Disease Control and Prevention. The National plan to eliminate syphilis from the United States. U.S. Government Printing Office. Washington, DC, 1999.

7. Holmes KK, Sparling PF, Mardh P, Lemon SM, Stamm WE, Piot P, Wasserheit JN. Sexually transmitted diseases (3rd edition). McGraw-Hill. New York, 1999.

8. U.S. Preventive Services Task Force. Screening for chlamydial infection. Am J Prev Med 2001;20(3S):90-94.

9. ACOG guidelines.

10. Nelson HD, Helfand M. Screening for chlamydial infection. Am J Prev Med;20(3S):95-107.

11. Genc M, Ledger WJ. Syphilis in pregnancy. Sex Transm Inf 2000;76:73-79.

12. Warner L, Rochat RW, Fichtner RR, Stoll BJ, Nathan L, Toomey KE. Missed opportunities for congenital syphilis prevention in an urban southeastern hospital. Sex Transm Dis. 2001;28:92-98.

13. Schulte JM, Burkham S, Hamaker D, St. Louis ME, Paffel JM, Hutcheson D, Caldwell MB, Dominguez KL, Levine WC. Syphilis among HIV-infected mothers and their infants in Texas from 1988 to 1994. Sex Transm Dis 2001;28:315-320

14. WA, Martin DL, Bertrand JR, Belongia EA. Physicians' practices and opinions regarding prenatal screening for human immunodeficiency virus and other sexually transmitted diseases. Sex Transm Dis 1998;25:169-175.

15. St Lawrence JS, Montano D, Kasprzyk D, Phillips W, Armstrong K, Leichliter J. National survey of US physicians' STD screening, testing, case reporting, clinical management, and partner notification practices. Am J Pub Health (in press).

16. Hammet TM, Kaufman JA, Faulkner A, et al. Sexually transmitted disease prevention in the United States: Integrated evaluation of public and private sector disease reporting and service delivery. CDC 200-93-0633, Phase I Final Report, 1997.

17. Department of Health and Human Services. Department of Health and Human Services; National Center for Health Statistics, data from the National Health Care Survey, 1995: Two parts: 1) National Ambulatory Medical Care Survey, 2) National Hospital Ambulatory Medical Care Survey. Government Printing Office. Washington, DC, 1997.

18. Weisbord JS, Koumans EH, Toomey KE, Grayson C, Markowitz LE. Sexually

transmitted diseases during pregnancy: screening, diagnostic, and treatment practices among prenatal care providers in Georgia. Southern Med J 2001;94:47-53.

19. Mehta, SD, Rothman, RE, Kelen, GD, Quinn, TC, Zenilman, JM. Clinical aspects of diagnosis of gonorrhea and chlamydia infection in an acute care setting. Cl Inf Dis, 2001, 32, 655-9.

20. Mehta, SD, Shahan, J., Zenilman, JM. Ambulatory STD management in an inner-city emergency department: descriptive epidemiology, care utilization patterns, and patient perceptions of local public STD clinics. Sexually Trans Dis, 2000, 17, 154-158.

21. Felton WF. A theory of the epidemiology of gonorrhea. Brit J Venereal Dis 1979;55:58-61.

Table 1. Demographic and Practice Characteristics of U.S. Obstetricians' and Gynecologists

Gender	Male %	Female %	
	66.8	33.2	
Race/Ethnicity			
	Hispanic %	Non-Hispanic %	
Asian	0	10.8	
Black/African American	0	5.2	
Native American	0	0.6	
Native Hawaiian/Pac. Isl.	0	0.8	
White	4.7	75.7	
Other/Mixed	0.6	0.8	
No race marked	0.9	0.1	
	----	----	
Total	6.2	93.8	
Mean Age (years)	Mean = 47.2	SD = 9.9	Mode = 43
Mean Years in Practice	Mean = 18.8	SD = 10.4	Mode = 15
Mean Hours/Week in Direct Patient Care	Mean = 46.9	SD = 19.0	Mode = 40
Mean Number of Patients/Week	Mean = 89.4	SD = 86.0	Mode = 100
Public versus private settings	Public %	Private %	
	5.8	94.2	
Surrounding Community size %			
<25,000 people	14.5		
25,001 - 50,000 people	9.3		
50,001 - 100,000 people	16.2		
100,001 - 250,000 people	14.7		
250,000+ people	26.3		
Suburb	18.9		

Practice Location %

Primary care office	80.2
Hospital ambulatory care	12.3
Hospital inpatient care	0.8
Student health clinic	0.6
Public health clinic	0.2
Community health clinic	0.9
Abortion clinic	0.5
Family planning clinic	0.5
Speciality clinic	3.1
Other clinic	0.9

Practice Type %

Solo	33.0
Single-specialty	49.7
Multi-specialty group	11.2
Staff model HMO	3.6
Other Managed Care	1.4
Other	1.1

Average Patient Age Distribution %

<13	1.0
13-25	22.7
26-40	35.5
41-60	28.3
61+	12.4

Average Patient Race/Ethnicity Distribution %

Asian	5.8
Black/African American	17.0
Native American	1.2
Native Hawaiian/Pac. Isl.	0.6
White	68.9
Other	5.4

Percentage of Hispanic patients	Hispanic	Non-Hispanic
	11.**7**	88.3

Note. $N = 647$. Not all respondents answered all questions; however, at least 97% of respondents answered each question.

Table 2. Screening Practices of U.S. Obstetricians and Gynecologists Compared with Other Specialists (% of physicians)

	Ob/Gyn % (n = 661)	**Others %** (n = 3,235 female)[1]	χ^2 (df =1)	ϕ
Screening for any STD	96.2	51.3	438.90***	.32
Chlamydia				
Non-pregnant females	54.6	31.4	128.07***	.18
Pregnant females	79.4			
Gonorrhea				
Non-pregnant females	50.9	27.2	141.78***	.18
Pregnant females	79.6			
Syphilis				
Non-pregnant females	22.9	19.1	5.15*	.04
Pregnant females	85.6			

Note. ϕ (phi) is the nominal effect size estimate between specialty (ob/gyn versus other) and screening rates. It approximates a correlation coefficient and should be read the same way. Positive values imply higher screening rates by obstetricians and gynecologists. Statistical significance levels are the same as for the chi-square tests.

[1]From the full dataset, we selected only those physicians seeing female clients for estimates and comparisons involving females.

*: $p < .05$; **: $p < .01$; ***: $p < .001$.

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Physicians' Opinions about Partner Notification Methods: Case Reporting, Patient Referral, and Provider Referral

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Running Head: HEALTH CARE PROVIDER

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Physicians' Opinions about Partner Notification Methods:

Case Reporting, Patient Referral, and Provider Referral

Although many sexually transmitted diseases (STDs) decreased in frequency throughout the 1990s in the US, STDs continue to represent a significant disease burden and public health challenge.[1] Partner notification is a public health strategy that responds to this challenge to reduce STDs by breaking the chain of infection. By successfully notifying partners of people diagnosed with STDs that they have been exposed to an infectious disease and encouraging them to seek medical evaluation, infected people are brought into treatment and the cycle of infection and reinfection is disrupted. In the United States, partner notification remains a core public health strategy for STD control of syphilis and HIV[2] and some jurisdictions also conduct partner notification for other STDs.[3] Given the substantial number of STDs that are treated in the private sector, successful partner notification requires cooperation between public and private physicians, public health officials and infected persons.

Three basic forms of partner notification are practiced in the public health sector. Techniques aimed at convincing the infected person to notify his or her sex partners of their exposure fall under the rubric of "patient-referral." Mechanisms through which a professional (usually a Disease Intervention Specialist: DIS) interviews the infected person to elicit names of sex partners and then notifies those partners are called "provider referral." In "contract referral" the infected person agrees to notify his/her sex partners within a defined period, after which time a professional will take over the task. For physicians, there is a fourth alternative that may result in partner notification. Case reporting by physicians to health departments can set in motion any of the three forms of partner notification described above. There is substantial variance among studies of the effectiveness of partner notification strategies, but as a general rule, meta-analytic studies suggest that provider referral identifies the most infected persons.[4-6] The purpose of this paper is to examine the opinions of physicians (public and private) toward various forms of partner notification.

Whatever the effectiveness of partner notification strategies in any given environment, each strategy other than patient referral is practiced almost exclusively in the public sector.[7] STDs, however, are not treated exclusively, or even predominantly, in the public sector. A recent estimate[8] suggests that only about 5% of STDs can be traced directly to treatment in public health STD clinics. Consequently, more of the onus for partner notification falls upon the private sector than is generally reflected in the research literature.

During 1999-2000, the Centers for Disease Control and Prevention (CDC), in conjunction with Battelle Centers for Public Health Research and Evaluation, conducted a national survey of physicians with respect to STD screening, testing, case reporting, and partner notification practices. Overall results from that survey are reported elsewhere.[7] Two conclusions from that report were that (a) private physicians (88% of respondents) saw numerous STDs in their practices, and (b) they did not report these diseases consistently. In fact, many physicians (27% to 50%, depending on the STD) were not even aware of the reporting laws in their states for any of chlamydia, gonorrhea, HIV, HSV, or even syphilis.[7, 9] These findings cohere with smaller surveys. For example, Seubert et al. [10] surveyed 108 physicians within a single health care system and found physicians typically acknowledged the importance of partner notification but were often unable to identify partner notification conditions or which STDs should be reported for partner notification.

Clearly, there is scope to improve partner notification, including in the private sector. St.

Lawrence et al. took the first step in estimating to what extent partner notification is practiced in the public and private sector as well as knowledge about reporting. This paper addresses the second step, which is to assess the range and depth of physicians' opinions about major partner notification strategies (e.g., provider referral, case reporting). By uncovering aspects of partner notification that physicians consider to be barriers and by comparing their responses across the three different partner notification strategies, we may uncover reasons why deficiencies exist. We may also be able to inform interventions aiming to increase the effectiveness of partner notification.

Methods

Participants and Procedure

A random sample of 7300 physicians in five specialties (obstetrics/gynecology, internal medicine, general/family practice, emergency medicine, pediatrics) were drawn from the American Medical Association's Physician's Master File because physicians in these five specialties treat 85% of all STD in the U.S.[11, 12] Further eligibility criteria were that the physicians spend 50%+ time in direct patient care and that they saw patients between the ages of 13 and 60 years.

Each participant received a survey via Federal Express, along with a cover letter explaining the aim of the survey, and a $15.00 cash incentive. This method, coupled with a reminder postcard and three waves of further mailings to non-respondents, yielded a final response rate of 70.2%, based on eligible physicians (undeliverable surveys, retired physicians, and those not in active practice were excluded from calculation of the response rate). We received 4223 surveys in total. Table 1 contains an overview of physician demographics and their practice characteristics.

Materials

The full survey[7] solicited practice characteristics, patient characteristics, STD diagnosis and reporting methods, as well as 17 opinions about types of partner notification (see Table 2). Responses to each item, assessed on five-point Likert scales (endpoints are “strongly disagree” and “strongly agree,” the midpoint is “neutral”), follow from each of three stems, representing case reporting, patient referral, and provider referral. The full stems were:

1. Reporting patients to the Health Department for follow-up... (case reporting, CR)
2. Encouraging your STD patients to contact their partner(s) themselves... (patient referral, PaR)
3. Collecting the names of partner(s) of STD patients and contacting them directly... (provider referral, PrR)

For example, a physician responding to the first item in Table 2 with the first stem indicated some level of agreement (1-5) with the full statement: “Reporting patients to the Health Department for follow-up complies with the standard of care in my clinic.” Because contract referral is a composite of patient and provider referral, because we had limited space in the questionnaire, and because the stem is complex, we did not collect information on contract referral from these physicians.

Analysis Plan

We wished to describe the range of physician opinions with respect to partner notification practices, present a parsimonious account of such variables, and outline how endorsement of opinions might vary with the type of partner notification practice. Although a simple presentation of item means and standard deviations suffices for the first aim, we needed to turn to exploratory factor analysis (EFA) to help us group related opinions into a smaller number of factors, each of which comprises several items. EFA groups items, depending on their correlations with one another. Thus, parsimony is an inherent value of EFA, but its true research value depends on whether the factors are interpretable. That is, for the resulting factors to be empirically useful, the groups of items that fall into the factors must make conceptual sense. For example, an empirical grouping of items concerning time into one factor would provide an interpretable factor, whereas an empirical grouping of items related to time, patient reactions, and physician discomfort would not be conceptually helpful. Interpretable factors comprising multiple items have the advantage of conveying clear meaning with a single score, compared to using scores on each of the individual items. This relative parsimony would accomplish the second aim.

Assuming a usable factor analysis, we planned a repeated measures multivariate analysis of variance (MANOVA), using the different types of partner notification (case reporting, patient referral, provider referral) as a repeated measures grouping variable, and the scales from the EFA as the outcome variables. Physicians had a score on each scale for each type of partner notification strategy. With this method, we planned to discern whether factor endorsement differs by type of partner notification strategy, the third aim. The repeated measures MANOVA yields a multivariate main effect for the repeated measures factor: type of partner notification strategy. The MANOVA also yields univariate oneway tests for each of the scales across levels of partner notification strategy (these are called the simple effects for the partner notification factor), which test whether physician scores differ for type of partner notification for each of the scales.

Results

Description of Sample

Demographically, the physician sample is representative of physicians in the US. Physicians' mean age was 46.2 years (SD = 10.3), with 2953 (70.9%) male respondents and 1214 (29.1%)

female respondents. Physicians had been practicing for a mean of 17.8 years (SD = 10.5), spending an average of 42.7 hours per week (SD = 16.7) in direct patient care. Most physicians saw a variety of patients, but estimated the majority of patients (62.6%) were female. Of female patients, physicians estimated that 16.2% were between ages 13 and 25, an age range with typically elevated rates for STD. The equivalent figure for males was 12.1%. Distributions of physicians and estimated patient race/ethnicity are contained in Table 1. Approximately two out of three physicians were in a primary care practice, with most of the remainder working in a hospital environment (including emergency rooms, urgent care hospital clinics, and ambulatory care facilities).

Physician Opinions Concerning Partner Notification Strategies

Descriptive Statistics. Physician responses to the 17 individual questions are contained within Table 2. The large number of respondents and the low standard deviations yielded high power to detect item differences according to the type of partner notification assessed. The smallest mean difference between any two comparisons is .07 points (CR versus PrR on question 14 in Table 2), and this difference is significant at $p < .001$. This significance level maintains in the face of a Bonferroni adjustment for the 42 possible comparisons, so, in short, scores on the variables all differ statistically from one another.

Over half the physicians (57.3%) agreed or strongly agreed that case reporting to health departments complied with their clinics' standards of care (item 1) and that doing so fulfilled any duty to warn (item 11, 70.5%). Physicians also viewed case reporting as a relatively effective means of controlling STD, with 81.5% agreeing or strongly agreeing that case reporting presented an opportunity for prevention education (item 13), and 40.7% agreeing or strongly agreeing that case reporting helped patients change their risk behaviors (item 14, versus 27.6% disagreeing or strongly disagreeing) and helped prevent the spread of STD (item 10, 82.7%). Physicians were neutral about whether case reporting consumed too much of their time (item 15, M = 2.82) or their staffs' time (item 16, M = 2.80).

Compared to case reporting, physicians were about as sanguine about the effects of patient referral. More physicians (70.1%) agreed or strongly agreed that patient referral complied with their clinics' standards of care, although somewhat fewer (67.4%) considered that doing so fulfilled a duty to warn. Physicians also viewed patient referral as about as effective as case reporting at controlling STD. Similar percentages of respondents agreed or strongly agreed that patient referral presented an opportunity for prevention education (89.7%), helped patients change their risk behaviors (51.9%) and helped prevent the spread of STD (83.5%). Physicians, on the whole, disagreed with the idea that patient referral would be too time-consuming for them (M = 2.12) or their staffs (M = 2.18).

Physicians were rather more doubtful about provider referral. Physicians as a group were more likely to disagree (41.4%) than agree (18.9%) that provider referral met their clinics' standards of care, although a majority (51.0% agreed/strongly agreed) felt that provider referral did at least fulfill a duty to warn. Although physicians tended to agree that provider referral was of some benefit to controlling STD, fewer physicians than in either of the above two conditions considered provider referral an opportunity for prevention education (69.7% agreed/strongly agreed), a help to changing patient risk behavior (37.7%), or a help to preventing the spread of STD (66.7%). Moreover, physicians were much more likely to feel that provider referral would be overly time-consuming for both themselves (M = 3.73) and their staffs (M = 3.72).

Exploratory Factor Analyses (EFA)

As stated earlier, the primary purpose of EFA is to provide a more parsimonious, but still conceptually meaningful, portrait of the physicians. We subjected the 17 items to three principal components analyses (one for each PN strategy), which yielded four factors (components) for each of the three EFAs (See Table 3). We then rotated the factors, using the varimax procedure to improve interpretability. Varimax rotations maximize the variance of items across the original factors: a useful outcome is that items tend to load more strongly on one factor than on any other. This outcome, called simple structure, (Thurstone) aids interpretability as long as the items on any one factor make conceptual sense.

The four factors together accounted for 62% of the total variance among the 17 items for case reporting (CR), 57.5% for patient referral (PaR), and 64.4% of the variance for provider referral (PrR). These percentages are similar enough to one another to suggest that results represent physicians' responses to the 17 items equivalently for each type of partner notification strategy. The factors were also interpretable, with Factor I representing physician norms for good service ("Norms"), Factor II representing the importance of maintaining good relations with patients ("Patient Relations"), Factor III representing the importance of STD control ("Infection Control"), and Factor IV representing the effects of time and money ("Time/Money").

Items loading onto the various factors are marked on Table 3 in boldface. On almost every occasion, each item loaded onto the same factor for each of the three forms of referral. Of the 51 conceptually important loadings listed in Table 3 (those in boldface), only five loaded naturally onto different factors. These five are marked on Table 3 in italics. For case reporting and provider referral, the item “not my responsibility” loaded as strongly onto Factor I as onto Factor II (with equivalent magnitudes). For patient referral, the item “fulfill my duty to warn” loaded as strongly onto Factor I as onto Factor III, also with equivalent magnitude. None of these three items gives especial cause for concern, as some fluctuations due to chance should be expected. The final two anomalies, however, were much larger in magnitude. Time concerns (both physician and staff time) for PaR loaded more strongly onto Factor II than for Factor IV. The alternative to using the PaR loadings for Factor IV, however, is to use the loadings of both CR and PrR for Factor II, which is more empirically problematic and conceptually less interpretable. In general, however, the pattern of loadings was amenable to the interpretation that physicians use the same patterns of criteria to evaluate all three strategies for partner notification.

Scaling Factors and Differences among Physicians by Type of Notification Strategy

To compare physician attitudes formally on each factor by type of strategy, we created scales from each factor, summing items loading most strongly onto each factor into a single score (i.e., Factor I became a four-item scale, etc.). Because the items tended to load onto the same factors for each type of strategy, we were able to scale the same items for each factor and thus make direct comparisons in a MANOVA framework. Means for the scales are contained in Table 4. We calculated internal consistencies for each of our 12 scales (representing four factors by three questions; see Table 3). The α coefficients are contained in Table 3 under the factor headings. All but one of the 12 scales derived had acceptable internal consistency according to conventional criteria. The α of .58 (Factor IV, PAR) was lower, but we included Factor IV in subsequent analyses.

Some items (those comprising Factors II and IV from Table 3) were recoded such that a high score indicated endorsement of the item. Thus, in Table 4, a relatively high mean on any given scale indicates that, compared to the other two strategies, physicians felt more favorable about the scale content with respect to its relation to partner notification. For example, the highest score of the three scale means for Time/money was 10.36 for PAR (patient referral). This result means that physicians felt that time and money were less of a hindrance to patient referral than they were to case reporting (M = 8.75) and provider referral (M = 6.79).

We then ran a repeated measures MANOVA, as described in Methods, using the three partner notification strategies as the repeated measures factor, see Table 4. The multivariate main effect for type of question was statistically significant, multivariate $F(2, 3767) = 941.83$, $p < .001$, $R = .52$. This main effect showed that physicians had different opinions on the four scales depending on the type of partner notification strategy. Subsequent univariate repeated measures ANOVAs testing for differences by type of question for each scale individually revealed significant differences by type of partner notification strategy for each scale, all ps <.001, see Table 4. Furthermore, contrast testing among the groups revealed significant differences at each level of each outcome variables, all at $p < .001$ (a Bonferroni correction yields a criterion p value of .004). That is, each group mean differed from the other two for each set of scale scores. Provider referral was uniformly rated least favorably and patient referral most favorably by physicians for each of the four factors. Cohering with descriptive statistics, physicians felt that patient referral was most congruent with practice norms, provided the least damage to physician-patient relationships, was the best means to control the chain of infection, and took the least resources in terms of time and money. Conversely, physicians felt that provider referral was the least dictated by practice norms, did the most damage to physician-patient relationships, was the worst method with respect to controlling STD infections, and that it took the most resources.

Discussion

A precis of our findings is that physician opinions about partner notification strategies are reducible to four areas, regardless of the particular notification strategy, and, of the strategies, physicians think least of provider referral and think best of patient referral. Case reporting falls in the middle. In the remainder of this discussion we assess these findings in terms of how they fit actual practice conditions (insofar as there are objective conditions) and discuss possible reasons why these findings exist. Using the four factors, we also address how different types of referral may be useful in different physician contexts. Final notes address the potential for further exploration of physician opinions beyond these descriptive data as well as recommendations for future research.

On one factor, time and money, physicians clearly reflect objective conditions. The case-finding efficacy of provider referral is generally superior to patient referral, but the procedure is more time-consuming and consequently more expensive (in terms of immediate costs). Depending on the clinical sequelae of an STD, provider referral may be more cost effective than other methods, but, at the time of choosing a partner notification method, the physician is faced with up front costs, not the extended benefits. For an individual physician, the situation is perhaps comparable to an HMO that has substantial client turnover. The costs the HMO incurs by starting a prevention program may not be offset by future benefits if the clients move on to other sources of health care.

The practice norms described on Factor I are essentially an induced piece of information with respect to how well the factor content fits “objective” practice norms. Although there are explicit norms for proper physician practice summarized at the most abstract level in the Hippocratic Oath, we know of no established norms for operationalizing such general norms with respect to partner notification. Therefore, this paper essentially defines those norms and the factor represents practice conditions by definition. But do these specific norms reflect more abstract norms of service to patients? Only if patient referral techniques (the physicians' favored method) bring about better care than provider referral. This implicit assertion lies at the heart of the remaining two factors and, here, physicians' opinions appear much less congruent with research evidence.

The obvious departure of opinions from the research evidence is visible in the relative scale scores on the factor "infection control." Physicians opined that patient referral was in fact a superior means of controlling STD to the other two methods as shown in Table 4. One might reply that the differences, although statistically different, are not practically very different at all (a difference of 1.44 points on a scale with a range of 20 points) and that, therefore, the difference in ratings is trivial. The main issue, however, is that provider referral, when practiced properly, is substantially more effective at infection control and that physicians are therefore underestimating the relative actual effectiveness of this method.

Less obvious is the case of patient relations, captured in the scale derived from Factor II. Here the magnitude of the differences in physician opinions among the three methods is far greater. There is also a prima facie case for expecting that the difference between patient and provider referral reflects reality in patient-physician relationships: that is, that questioning patients about their sex partners actually would upset the patients and cause them not to return. The limited evidence available,[13, 14] however, contradicts these opinions in that, while patients can be upset by the prospect of their sex partners being told of their exposure to an STD, they generally agree that referring partners is necessary (this opinion does not necessarily hold for HIV/AIDS). Thus the practice of provider referral is unlikely to damage the patient-physician relationship significantly. Furthermore, any aggravating factors in provider referral are almost certainly balanced by its contribution to appropriate patient care (e.g., less chance of reinfection) and the fact that the concept of informing partners is also inherent in patient referral. Case reporting certainly removes the subject matter of referral from the patient-physician relationship directly, but we are curious as to why physicians would construe case reporting as less damaging to a relationship in the long run. After all, the same interview is conducted, just with a different person with whom the patient is completely unacquainted, and the causal agent (the reported case) is clear.

To some degree the three different forms of partner notification are linked by the extent to which the diagnosing physician has to maintain contact with patients and their partners over a sensitive topic, that is, sexual behavior. With patient referral, the topic can be dismissed in a sentence or two (i.e., "You should bring your partners in for treatment so they can be tested and treated, and you won't get reinfected."); with case reporting the physician has to dwell on the topic for longer, albeit not necessarily in the patient's presence; with provider referral, there is the matter of a more extensive interview. Many physicians are uncomfortable talking about sexual behavior,[15, 16] especially with opposite sex patients[17] as well as some of the most at-risk patients, adolescents and young adults.[18] Consequently, the source of some of the imagined distress to the patient-physician relationship may be actually due to physician discomfort projected onto the patient, rather than patient discomfort per se. Such discomfort might be further displaced onto opinions about the relative effectiveness of provider referral, resulting in unrealistically lower estimations of its effectiveness. Consistent with this interpretation of the scales are the results in Table 2 showing that physicians felt less comfortable with and less trained to perform provider referral.

Given the nature of the differences in physicians' opinions about the three partner notification strategies, what are the implications for the relationship between public sector services and private physicians? One answer is to simply accommodate physician opinions about provider referral and work on achieving an optimal case reporting system from all physicians to public sector health departments employing DIS. Optimal includes the concept of timeliness as referral is far more effective at preventing reinfections and secondary infections if contacts are tracked swiftly. Under such circumstances, direct reporting by the physician (rather than relying on lab reporting, for example) is likely vital.

Alternatively physicians could collect locating information and pass this on to DIS. DIS in most jurisdictions rarely have the time to follow gonorrhea cases (let alone chlamydial infections) and locating information could help alleviate DIS workloads. If nothing else, physicians often have some locating information for patients for billing purposes.

Much of what we have written in this discussion is (informed!) speculation and inference, which may be refined by further analyses. The next steps for these physician data include modeling opinions in a framework of behavioral theory, which may inform specific interventions that bring about improvements in partner notification with its attendant impact on the chain of infection.

Whether a description of partner notification in the US or a source of formative data for intervention research, this survey's value would likely be enhanced by repeating it at some later date. With a repeated survey, the current data could serve as a baseline to evaluate interventions, including policy interventions. Longitudinal data would also permit evaluation of cohort effects and historical trends in physicians' conceptualizations of partner notification, an area in which we currently have little data.

In conclusion, we conducted a national survey that collected information on physicians' opinion of current partner notification practices. Results suggest relative antipathy toward provider-based referral, with some reasons cohering with evidence-based conclusions (e.g., resources required) and some not (e.g., the impact of this referral method on infection control). Survey data in the current paper not only describe the nature of these opinions, but also suggest some avenues for improving partner notification approaches.

References

1. Division of STD Prevention. Sexually transmitted disease surveillance, 1999. Department of Health and Human Services, Atlanta: Centers for Disease Control and Prevention, 2000.

2. Fenton KA, Chippindale S, Cowan FM. Partner notification techniques. Dermatol Clinics 1998;16:669-72.

3. Golden MR, Hogben M, Handsfield HH, St. Lawrence JS, Potterat JJ, Holmes KK. Partner notification for HIV and STD in the United States: A survey of health departments in High Morbidity Areas shows low coverage for gonorrhea, chlamydial infection, and HIV.

4. Oxman GL, Doyle L. A comparison of the case-finding effectiveness and average costs of screening and partner notification. Sex Transm Dis 1996;23:51-7.

5. Macke B, Maher J. Partner notification in the United States: An evidence-based review. Am J Prev Med. 1999;17:230-242.

6. Oxman AD, Scott EAF, Sellors JW, Clarke JH, Millson ME, Rasooly I, Frank JW, Naus M, Goldblatt E. Partner notification for sexually transmitted diseases: An overview of the evidence. Can J Public Health 1994;85(suppl 1):S41-7.

7. St. Lawrence JS, Montano DE, Kasprzyk D, Phillips WR, Armstrong K, Leichliter J. National survey of US physicians' STD screening, testing, case reporting, clinical management, and partner notification practices. Am J. Public Health (in press).

8. Brackbill RM, Sternberg MR, Fishbein M. Where do people go for treatment of sexually transmitted diseases? Fam Plann Perspect. 1999;31(1):10-15.

9. Montaño DE, Phillips WR, Armstrong K, St. Lawrence J, Kasprzyk D. Knowledge of HIV

and AIDS public health reporting requirements among a national sample of primary care and emergency room physicians in the United States. Paper presented at the 13th International AIDS Conference, Durban, South Africa July, 2000.

10. Seubert DE, Thompson IM, Gonik B. Partner notification of sexually transmitted disease in an obstetric and gynecologic setting. Obstet Gyn 1999;94:399-402.

11. Hammet TM, Kaufman JA, Faulkner A, et al. Sexually transmitted disease prevention in the United States: Integrated evaluation of public and private sector disease reporting and service delivery. CDC 200-93-0633, Phase I Final Report, 1997.

12. Department of Health and Human Services. Department of Health and Human Services; National Center for Health Statistics, data from the National Health Care Survey, 1995: Two parts: 1) National Ambulatory Medical Care Survey, 2) National Hospital Ambulatory Medical Care Survey. Washington, DC: U.S. Government Printing Office, 1997.

13. Clarke, J. Distressed women take contact tracing seriously. Br Med J 2001;323:236.

14. Nuwaha F, Kambugu F, Nsubuga PS. Factors influencing sexual partner referral for sexually transmitted diseases in Uganda. Sex Trans Dis 1999;26:483-9.

15. Perlman SE, Postlethwaite D, Stump S, Bielan B, Rudy SJ. Taking a sexual history from and counseling women on teratogenic drugs. J Reprod Med 2001;46(2 Suppl):163-8.

16. Wheat ME, Hyman RB, Devons C, Solomon S. Preventing HIV transmission: Behavior and attitudes of medical house staff in a high-prevalence area. Am J Prev Med 1993;9:307-16.

17. Lurie N, Margolis K, McGovern PG, Mink P. Physician self-report of comfort and skill in providing preventive care to patients of the opposite sex. Arch Fam Med 1998;7:134-7.

18. Torkko KC, Gershman K, Crane LA, Hamman R, Baron A. Testing for chlamydia and sexual history taking in adolescent females: Results from a statewide survey of Colorado primary health care providers. Pediatrics 2000;103:E32.

Table 1

Characteristics of Health Care Providers and their Patients

Racial/Ethnic heritage	**n**	**%**
American Indian/Alaskan Native	32	0.8
Asian	526	12.6
Black/African-American	169	4.0
Native Hawaiian/Pacific Islander	15	0.2
White	3253	77.9
Other	183	4.4
Hispanic/Latino Origin (any race/ethnicity)	206	5.0

Practice location		**n**	**%**
Primary care		2864	68.8
Hospital setting	877	21.1	
University		32	0.8
Community health clinic	104	2.5	
Public health clinic		37	0.9
Urgent care clinic		78	1.9

Family planning clinic	4	0.1	
Abortion clinic	6	0.1	
STD clinic		1	0.0
Specialty care clinic		67	1.6
Other		95	2.3
Patient Racial/Ethnic Heritage			**%**
American Indian/Alaskan Native			1.1
Asian			4.8
Black/African-American			18.3
Native Hawaiian/Pacific Islander			0.6
White			67.5
Other			6.7
Hispanic/Latino Origin (any race/ethnicity)			12.9

Note. More than 98.5% of the 4226 providers answered all these questions.

Table 2

Means and Standard Deviations for Item Responses by Type of Notification

	CR Case reporting		PAR Patient referral		PRR Provider referral	
	M	**SD**	**M**	**SD**	**M**	**SD**
1. complies with clinic standard of care	3.61	0.9	3.77	0.9	2.74	0.9
2. what most of my colleagues do	3.25	1.0	3.47	0.8	2.46	0.9
3. expected by my Health Department	3.69	0.9	3.56	0.8	2.79	1.0
4. valued in my clinic setting	3.37	1.0	3.81	0.8	2.81	0.9
5. I don't feel comfortable	2.54	1.2	2.08	0.9	3.48	1.1
6. I don't feel well trained	2.51	1.1	2.28	0.9	3.09	1.0
7. causes my patients not to return	2.67	1.0	2.29	0.8	3.12	1.0
8. gets the patient upset with me	3.01	1.0	2.29	0.8	3.38	1.0

9. not my responsibility	2.27	1.0	1.97	0.8	3.14	1.0
10. help prevent spread of STD	4.16	0.9	4.08	0.8	3.66	1.0
11. fulfill my “duty to warn”	3.81	0.9	3.67	0.9	3.40	1.0
12. protects my patients from reinfection	3.58	1.1	3.66	1.0	3.42	1.0
13. opportunity for prevention education	4.01	0.8	4.13	0.7	3.72	0.8
14. helps patients change their risk behavior	3.18	1.1	3.42	1.0	3.11	1.0
15. take too much of my time	2.82	1.1	2.12	0.9	3.73	1.0
16. take too much staff time	2.80	1.2	2.18	0.9	3.72	1.0
17. an activity I won’t get paid for	3.57	1.1	3.28	1.1	3.72	1.0

Note. N varies between 3,844 and 4,006, dependent on skipped responses. Response scale: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree.

Table 3

Factors Describing Physician Opinions to Partner Notification

	Factor I			Factor II			Factor III			Factor IV		
	“Norms”			“Patient relations”			“Infection control”			“Time/money”		
	CR	**PAR**	**PRR**	**CR**	**PAR**	**PRR**	**CR**	**PAR**	**PRR**	**CR**	**PAR**	**PRR**
% of variance=	18.1	13.7	17.1	17.6	21.6	15.3	15.6	15.4	17.0	10.7	6.8	14.1
Scale alpha=	.86	.74	.83	.83	.79	.79	.75	.74	.80	.67	.58	.82
complies with clinic standard of care	**.794**	**.571**	**.736**	-.206	-.135	-.124	.279	.391	.259	-.060	-.218	-.141
what most of my colleagues do	**.785**	**.736**	**.786**	-.187	-.189	-.140	.185	.100	.010	-.109	-.015	-.135
expected by my Health Department	**.792**	**.743**	**.775**	-.170	-.096	-.038	.169	.096	-.083	-.037	.164	-.093
valued in my clinic setting	**.646**	**.673**	**.777**	-.229	-.295	-.176	.343	.320	.250	-.145	-.001	-.146
I don’t feel comfortable	-.273	-.216	-.256	**.772**	**.671**	**.690**	-.082	-.070	-.071	.124	.171	.257
I don’t feel well trained	-.197	-.208	-.189	**.717**	**.592**	**.576**	-.012	-.032	.010	.112	.298	.194
causes my patients not to return	-.130	-.126	-.013	**.819**	**.630**	**.858**	-.140	-.097	-.117	.129	.399	.088
gets the patient upset with me	-.108	-.051	-.070	**.776**	**.666**	**.865**	-.123	.024	-.065	.156	.380	.139

not my responsibility	-*.421*	-.235	-*.479*	**.404**	**.593**	**.335**	-.250	-.219	-.236	.348	-.085	*.352*
help prevent spread of STD	.206	.182	.064	-.203	-.101	-.046	**.676**	**.711**	**.776**	-.025	-.044	.001
fulfill my “duty to warn”	.339	*.409*	.288	-.156	.056	-.020	**.493**	**.387**	**.570**	.146	-.334	.164
protects my patients from reinfection	.091	.149	.069	-.103	-.013	-.021	**.764**	**.778**	**.804**	-.074	-.118	-.104
opportunity for prevention education	.213	.249	.160	-.129	-.234	-.108	**.679**	**.622**	**.739**	-.058	-.030	.010
helps patients change their risk behavior	.131	-.049	.130	.015	-.079	-.063	**.723**	**.759**	**.736**	-.164	-.024	-.151
take too much of my time	-.330	-.047	-.177	.308	*.845*	.176	.005	-.159	-.034	**.777**	**-.232**	**.901**
take too much staff time	-.320	-.035	-.173	.327	*.844*	.187	-.001	-.149	-.045	**.772**	**-.236**	**.896**
an activity I won’t get paid for	.157	.081	-.116	.021	.136	.214	-.135	-.114	-.054	**.573**	**.644**	**.627**

Note. N=3,844. CR = Case reporting; PAR = Patient referral; PRR = Provider referral. Percentage of variance refers to the proportion of variance accounted for by each factor (I - IV) for each variable (CR - PRR). Scale alpha refers to coefficient alpha (internal consistency) for each of the boldfaced items defining the four factors (I - IV) across the three variables (CR - PRR).

Table 4

Repeated Measures Multivariate Analysis of Variance of Four Scales

Multivariate $F(8, 15366) = 941.83$, $p < .001$. $R^{2(sample)} = .267$, $R^{2(population)} = .266$

		CR		**PAR**		**PRR**			
		Case reporting		Patient referral		Provider referral		Univariate F	p
Scale	**Range**	**M**	**SD**	**M**	**SD**	**M**	**SD**	df = 2, 7686	
Norms	4-20	13.73	3.32	14.43	2.76	10.66	3.09	2191.55	<.001
Patient relations	5-25	16.94	4.15	18.99	3.26	13.71	3.79	2997.94	<.001
Infection control	5-25	18.62	3.51	18.86	3.25	17.18	3.69	527.78	<.001
Time/money	3-15	8.75	2.68	10.36	2.20	6.79	2.61	3303.21	<.001

Note. N = 3,844. Within rows, simple contrasts revealed that all means differ significantly from one another at $p<.001$ (critical p value with a Bonferroni correction = .0042). The multiple correlation for the MANOVA = .518 (moderate size). High means indicate relatively high endorsement of the partner notification strategy. For example, a high mean for Time/money on PAR relative to PRR indicates providers thought patient referral would be less troublesome relative to PRR in terms of time and money.