

The Changing Role of Disease Intervention Specialists in Modern Public Health Programs

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For decades, disease intervention specialists have worked on the front lines of public health, defending against the spread of sexually transmitted diseases (STDs), including HIV. The transmission of STDs can be interrupted when a disease intervention specialist contacts recently diagnosed persons, ensures that they are treated, identifies their sexual partners, and ensures that the partners are tested and treated. The success of this work depends on the ability and willingness of patients to name their sexual partners; the ability of the disease intervention specialist to promptly interview infected persons, find their sexual partners by using available resources, and maintain patient confidentiality; and the cooperation of local providers and community stakeholders in coordinating prevention messaging. With proper training and resources, disease intervention specialists provide an effective, albeit costly, service for health departments to control the spread of STDs and HIV.¹

The work of disease intervention specialists originated in the 1930s when syphilis was endemic in the United States.² At the time, health departments used staff members (who would eventually become known as disease intervention specialists) to ensure that all persons with a diagnosis of syphilis were treated and that their contacts and suspected sources of infection were investigated. This service was considered beneficial because it verified treatment for patients with a new diagnosis of syphilis and established partnerships with key community stakeholders. In the 1940s, the Centers for Disease Control and Prevention (CDC) established a federally funded workforce to increase local capacity to control syphilis and work side-by-side with state and local disease intervention specialists. Collectively, these disease intervention specialists were also enlisted to help control gonorrhea in the 1970s and HIV starting in the late 1990s.³⁻⁵ Because disease intervention specialist skills are valuable for various types of public health efforts, they contribute to outbreak investigations for other infectious diseases⁵ and to public health preparedness responses.⁶

Sexual partner notification services provided by disease intervention specialists is time-consuming and labor

intensive, and in most settings, it is still considered one of the most effective means of case finding for syphilis and HIV.^{1,3,7-9} However, increasingly, disease intervention specialists have difficulty conducting the kind of in-person partner notification services they have used historically. Although demands on disease intervention specialists have increased, including larger caseloads due to a growth in STD rates, the number of disease intervention specialists hired¹⁰ has not increased nor has the salary for existing staff members (written personal communication, Dawn Broussard, CDC, August 2017, and Sandy White, North Carolina Department of Health and Human Services, August 2017). Poor pay and the resulting high staff turnover have increased the caseload burden for the remaining disease intervention specialists.

Our experience has led us to believe that poor pay, high staff turnover, and increased caseloads have caused a drop in the morale of disease intervention specialists and a diminished ability of health departments to interrupt STD transmission. Furthermore, we have observed that, as surveillance databases used by public health programs have grown in both size and power, disease intervention specialists have been asked to input more of the notes they collect during patient interviews into these systems to assist with case management and disease investigations, both current and future. We believe that the rise in data entry labor has caused disease intervention specialists to spend less time in the field than they did a decade ago. Finally, we believe

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that an increase in the number of reported but unlocatable partners^{9,11,12} and inadequate access to websites and other essential technological tools by disease intervention specialists¹³ likely have contributed to difficulty finding partners at risk of STD exposure.

Although partner notification outcomes have been analyzed extensively,^{1,13,14} the literature contains no information on the effects of poor pay and expanded responsibilities on disease intervention specialist turnover, morale, and performance. To begin to better understand these effects, we conducted interviews via telephone and a written survey with all North Carolina Field Services Unit regional supervisors (n = 6) and managers (n = 2) in December 2016. This small survey, although anecdotal, can help generate hypotheses on the challenges faced by modern disease intervention specialists.

In North Carolina, supervisors direct the day-to-day operations of 31 state-employed disease intervention specialists and other regional program staff members. Supervisors are often former disease intervention specialists who have rich knowledge and historical perspective about the work of disease intervention specialists. Two managers and 1 medical director at the state health department oversee all state-employed supervisors and disease intervention specialists. In addition to state employees, 7 federal field staff members and approximately 15 county-employed disease intervention specialists in local health departments with the highest HIV/STD morbidity in the state also contribute to services provided by the North Carolina Field Services Unit.

We developed a 2-part, standardized instrument to interview the 8 state-employed Field Services Unit supervisors and managers (hereinafter “supervisors”) about the work of disease intervention specialists. First, we distributed a written survey to the supervisors to estimate the time that disease intervention specialists spent in 2016 and 2006 (or when the supervisor was first hired, if after 2006) on core activities, such as patient and partner interviews, record searches in state surveillance data, provider education, and data entry. Second, we conducted in-depth, open-ended interviews by telephone with each supervisor to understand the evolution of disease intervention specialist duties, on-the-job challenges, and perceived areas for improvement. We reviewed and summarized common themes revealed in both the open-ended interview and written survey. We extracted illustrative quotations directly from the open-ended interviews. Because we interviewed only state-employed staff members, responses may not apply to the experiences of county or federally employed staff members.

Evolving Relationship With Patients, Partners, and Providers

The increase in the number of websites for meeting sexual partners may interfere with the ability of disease intervention specialists to provide partner notification services. According to unpublished North Carolina surveillance data, from

2013 through 2016, the proportion of patients with primary, secondary, or early latent syphilis who reported meeting sexual partners online increased from 32% in 2013 to 41% in 2016. The same proportion for patients with diagnosed HIV infection increased from 21% in 2013 to 30% in 2016.¹⁵ One supervisor said that the internet is “a big thorn in our side.” Another supervisor noted that online partner meeting sites make it difficult to find geographic clusters of disease, because hook-ups do not consistently occur at the same place. He thought that patients who meet sexual partners online often spend less time with the sexual partner than patients who meet partners by other means, and these patients could not or would not give the disease intervention specialist a useful physical description of their online sexual partner. Furthermore, supervisors noted that some sexual partners use online pseudonyms that frequently change, making it difficult for the disease intervention specialist to find them.

In our interviews, supervisors indicated that patients contacted by disease intervention specialists in North Carolina were less forthcoming with risk information and partner names in 2016 than before 2006. They said that many recent patients had a diagnosis of syphilis and were interviewed by a disease intervention specialist more than once. These patients may be more aware of public health law than patients diagnosed with an STD for the first time and will disclose only the minimum amount of information needed to complete an interview. Two supervisors observed that patients were more skeptical of government than patients of the past. One opined that patients’ desire for privacy from government interference has made them “combative and resistant” toward disease intervention specialists, leading to concerns for safety among disease intervention specialists and reducing their desire to conduct in-person field visits. Several supervisors noted that disease intervention specialists were less likely to meet patients in clinics in 2016 than before 2006 because of a stronger desire for confidentiality and would rather be interviewed in the privacy of their home or car.

Investigating and relating to patients requires creativity on the part of disease intervention specialists. According to one supervisor we interviewed, using a variety of approaches keeps things “fun and exciting.” However, the supervisor also said that if a disease intervention specialist becomes hardened by patients who repeatedly become infected with syphilis or are difficult to interview, the disease intervention specialist can become frustrated, which “is bad for disease intervention specialist work.” This hardening likely contributes to staff turnover, which in turn may lead to weakened relationships with patients and community stakeholders, at least temporarily, and hinder opportunities for collaboration and coordination of patient care.

Historically, disease intervention specialists have spent most of their time locating and notifying contacts.¹⁶ Although supervisors indicated on the written survey that disease intervention specialists still spend the largest

Table. Median number of yearly interviews^a for syphilis^b and HIV infection assigned to disease intervention specialists in the North Carolina Department of Health and Human Services, 2013-2016

Year	Total No. of Disease Intervention Specialists in North Carolina ^c	Syphilis		HIV	
		No. of Disease Intervention Specialists Assigned to at Least One Interview	Median No. (Range) of Assigned Interviews per Disease Intervention Specialist	No. of Disease Intervention Specialists Assigned to at Least One Interview	Median No. (Range) of Assigned Interviews per Disease Intervention Specialist
2013	84	69	17 (1-91)	72	19 (1-95)
2014	77	67	36 (1-115)	68	26 (1-123)
2015	74	69	52 (1-207)	67	22 (1-86)
2016	66	65	51 (1-213)	55	32 (1-125)

^aIncludes first interviews and follow-up interviews for patients with syphilis and HIV.

^bDuring all stages of syphilis.

^cInclusive of federal, state, and local disease intervention specialists and other North Carolina Field Services Unit staff members who are trained as disease intervention specialists and occasionally assigned interviews (eg, supervisors, managers).

proportion of their time in the field locating patients and their partners, this time is shrinking. This reduction in fieldwork may be the result of on-the-job efficiencies (eg, texting or calling patients to arrange meetings before initiating on-the-ground searches) or competing demands to stay in the office to enter data in surveillance databases. Alternatively, an increase in the proportion of partners who are not named and are not traceable may have reduced contact investigations in the field. Strategies to maximize interviews with infected persons at or near the time of testing (eg, presumptive interviews, rapid diagnostics) may reduce the time spent finding patients again later and may improve the quality of data collected.

Interpersonal and Computer Skills Are Equally Important

Data entry requirements have changed the work of disease intervention specialists. In 2012, the North Carolina Department of Health and Human Services started capturing data on STD-related surveillance and field services' case management in the North Carolina Electronic Disease Surveillance System (NC EDSS).¹⁵ Although supervisors said that NC EDSS benefits field investigations by allowing disease intervention specialists to search for cases of HIV and STD statewide and eliminating paper records, the system is large and requires what one supervisor called "mental gymnastics" to properly record all required information. Increases in data entry require disease intervention specialists to spend more time in the office. In 2014, the Field Services Unit determined that disease intervention specialists spent 21% of their time entering data in NC EDSS (unpublished data). On our written survey, North Carolina supervisors estimated that disease intervention specialists spent 30% of their time in 2016 performing data entry tasks compared with 20% in 2006. Because of the need for accurate and timely data entry, all supervisors said they seek job candidates with proficient computer skills.

Vital Public Health Skill Set

In North Carolina, when disease intervention specialists are hired, they receive extensive training. In addition to instruction on inputting data into NC EDSS, they are trained about HIV, syphilis, and common comorbid diseases; how to conduct phlebotomy; investigation protocols; interviewing techniques; partner notification; case management; and HIV counseling. Disease intervention specialists also should be well versed on the latest smartphone applications (apps) and websites patients use to meet sexual partners and how to navigate these online venues to refer sexual partners for prevention services. Because of the varied on-the-job responsibilities, one supervisor we interviewed noted that a good disease intervention specialist needs to be a "chameleon" to adapt to various situations. Disease intervention specialists must be able to shift gears on the fly because "they could be in a prominent physician's office in the morning and a crack house later in the day." Several supervisors said that disease intervention specialists should be caring and empathetic to make patients feel comfortable sharing intimate details about their sex lives, but they also should be firm. The supervisors said that successful disease intervention specialists are organized, self-motivated, and able to work independently with minimal supervision.

Technology Complements Disease Intervention Specialist Work

The increase in reported cases of syphilis in North Carolina since 2013¹⁷ has not been accompanied by a similar increase in the size of disease intervention specialist staffs. This increase in reported cases has resulted in larger caseloads assigned to each disease intervention specialist.^{10,17} According to Field Services Unit records in North Carolina from 2013 through 2016, the median yearly number of interviews and reinterviews assigned to disease intervention specialists increased from 17 in 2013 to 51 in 2016 for syphilis and from 19 in 2013 to 52 in 2016 for HIV (Table). Despite the

increased caseload, supervisors said that disease intervention specialists are expected to meet the same investigational deadlines as in previous years, when their caseload was lighter. Overall, supervisors agreed that disease intervention specialists do not have time to complete all assigned fieldwork.

Furthermore, in North Carolina, most disease intervention specialists do not have access to certain technologies (eg, telephones, apps) that supervisors said were essential to disease intervention specialist investigations. Similar to policies in other jurisdictions,¹³ current North Carolina state government policies limit the official use of social media websites and apps that patients use to meet sexual partners to one university-contracted field staff member because of legal concerns about the use of government-owned electronic devices to access these sites. Although all state-employed disease intervention specialists can conduct telephone interviews, concerns about patient confidentiality make telephone interviews permissible only in special situations when there is no other reasonable way to communicate with patients in person. Some supervisors felt that without access to current technology, disease intervention specialists may not evolve with the communities they serve and consequently may be unable to connect both literally and figuratively with their patients. Texting or messaging patients and their partners via mobile apps^{1,18-21} and telephone interviews²² may be useful tools for disease intervention specialists to efficiently and effectively locate patients and their sexual partners, particularly patients who are unavailable during traditional business hours, live in remote parts of the state, or report large numbers of online partners. To allow for the integration of telephone and internet technology currently used by patients into disease intervention specialist work, state and local government policies will need to be changed.

Valuable but Not Valued?

Health departments need to maintain a cadre of experienced and well-qualified disease intervention specialists who can investigate patients with STDs and who can also occasionally work on other outbreaks. However, this preservation of expertise may not be possible because of staff attrition at the federal level and staff turnover at the state level. Capacity to conduct partner notification increased from 1970 to 1990 as federally hired disease intervention specialists were posted to state and local jurisdictions (unpublished data, CDC, Public Health Advisor Field Staff: History Functions and Current Deployment, 1990).⁵ However, the federal government stopped recruiting new disease intervention specialists in 1994,⁵ which resulted in a reduction of federally assigned STD program staff members from a peak of 511 in 1992 to 80 in 2017 (written communication, Dawn Broussard, CDC, August 2017). According to supervisors in North Carolina, state-employed disease intervention specialists frequently use the experience they gain in the Field Services Unit and find jobs where they have more opportunity for

advancement, earn a higher salary, and have fewer demands. Because many disease intervention specialists move out of field services to advance their careers, health departments are often unable to capitalize on the investments they have made in training. These structural issues are probably not unique to North Carolina and deserve attention from health departments across the country to improve job support and satisfaction among disease intervention specialists and to maintain investigative expertise within STD programs.

All of the supervisors we interviewed agreed that the top reason disease intervention specialists leave their job is money. In North Carolina, disease intervention specialist work has always been an entry-level job; from 2006 to 2016, the posted starting salary for a college-educated disease intervention specialist increased at the level of inflation, from \$29 348 in 2006 to \$35 474 in 2016 (written communication, Sandy White, North Carolina Department of Health and Human Services, August 2017). One supervisor suggested that, without a private-sector equivalent to disease intervention specialist work, the health department does not have a nongovernmental referent for compensation and, therefore, it cannot post the job with a salary commensurate with the necessary skills and experience. Another supervisor thought salary was not the only driver of job satisfaction, stating, “You don’t get into [disease intervention specialist work] because of the money.” However, all the supervisors we interviewed were aware that a persistently low salary contributes to disease intervention specialists feeling unappreciated and undervalued by the health department. Supervisors indicated that they try to motivate disease intervention specialists by offering flexible schedules and attendance at local or national conferences. All supervisors said they try to exhibit verbal appreciation for disease intervention specialist work, but they perceived that most current disease intervention specialists tend to value monetary appreciation more highly than nonmonetary appreciation.

Conclusion

Disease intervention specialists have a valuable set of skills that can be used not just for STD partner investigations but also for other public health responses. Therefore, many health departments have expanded disease intervention specialist duties beyond traditional partner notification services. Today, disease intervention specialists provide partner notification services for patients with multiple STDs; case management services for HIV-infected patients; preexposure prophylaxis referrals for preventing HIV acquisition among high-risk HIV-negative patients; resources about STDs for community stakeholders; data entry services for disease surveillance; and investigational expertise for nonsyphilis/non-HIV outbreaks, including tuberculosis and viral hepatitis. This increase in duties in the context of low pay and a tripling of syphilis morbidity in North Carolina has left many disease intervention specialists feeling underappreciated and overworked. These issues are likely not unique to North Carolina,

and they represent a broader lack of institutional support for public health infrastructure at the federal, state, and local levels. A national effort to develop a certification to standardize the skill set of disease intervention specialists is expected to increase recognition of the crucial public health contributions made by disease intervention specialists,²³ which may create a pathway to increase salaries, encourage retention, and improve morale. Rigorous evaluation of the disease intervention specialist certification and other potential solutions for overcoming barriers, such as enhanced access to technological tools for partner finding, increases in salary, or prioritization of investigations to reduce disease intervention specialist workload and burnout, is warranted in health departments across the country. These local efforts, which can be shared across jurisdictions, are important for maintaining the disease intervention specialist workforce.

Authors' Note

The findings and conclusions in this article are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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