

*Original Research***STD services delivery arrangements in Georgia county health departments**

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ABSTRACT

Background: Uniformity, standardization, and evidence-based public health practice are needed to improve the efficiency and quality of services in local health departments (LHDs). Among the highest priority and most common public health services delivered by LHDs are services related to sexually transmitted diseases (STDs) and sexually transmitted infections (STIs).

Objective: The purpose of this study was to examine potential variations in the delivery of sexually transmitted disease (STD) services among county health departments (CHD) in Georgia, to determine if potential variations were due to varied administrative practices, and to understand delivery arrangements so that future cost studies can be supported.

Methods: Web-based surveys were collected from 134 county health departments in Georgia in 2015.

Results: Screening for gonorrhea, chlamydia and syphilis occurred in all the surveyed CHDs. Sixty-eight percent of the CHDs had one or more staff who performed investigations for persons already screened positive for STDs. Partner notification services provided by the CHD staff occurred in only 35 percent of the surveyed CHDs.

Conclusions: Variances regarding diagnostic methodologies, work time expenditures, and staff responsibilities likely had an influence on the delivery of STD services across Georgia's CHDs. There are opportunities for uniformity and standardization of administrative practices.

Key words: STDs, county health departments, quality of services, Georgia

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INTRODUCTION

To improve efficiency and quality of services, local health departments (LHDs) strive for uniformity, standardization, and evidence-based public health practice (Rodriguez, Chen, Owusu-Edusei, & Bekemeier, 2012; Shah & Madamala, 2015). Services related to sexually transmitted diseases (STDs) and sexually transmitted infections (STIs) are among the high priority and most common public health services delivered by LHD (Shah, Luo, & Sotnikov, 2014). An STD is described by the Georgia Department of Public Health as "...an infection that can be passed through sex or sexual contact (GA DPH, 2016)." These include bacterial vaginosis, chlamydia infection, genital herpes infection, gonorrhea, human papillomavirus infection, pelvic inflammatory disease, syphilis, trichomoniasis, HIV/AIDS, and Hepatitis B and C (GA DPH, 2016). LHDs appear to be responsive to the evidence that STDs are common in the United States and may contribute to health disparities, as certain population subgroups have a disproportionate burden (Satterwhite et al., 2013). STDs represent a tremendous financial burden with an estimated \$15 billion annual direct cost nationally (Owusu-Edusei et al., 2013).

Studies suggest that the cost of STI and STD services may vary significantly by place of service delivery and method of screening and diagnosis (Owusu-Edusei, 2016). Cost efficient delivery of STD services is highly desirable for public health agencies and requires a thorough understanding of the STD service delivery arrangements (Bernstein, 2016). Cost efficiency is important because local public health agencies operate in a complex dynamic environment marked by fiscal restraints and staff reductions (Erwin, Shah, & Mays, 2014; Jiali, Leep, & Newman, 2015; Leider et al., 2014; Willard, Shah, Leep, & Ku, 2012). LHDs serving rural communities are particularly affected by the stress of reduced infrastructural capacities coupled with increased emphasis on quality improvement and evidence-based public health (CDC, 2015; CDC, 2010; Shah & Madamala, 2015).

At the local level, STD screening, treatment, and prevention services are offered through a variety of providers in order to reach diverse populations. These providers include hospitals, Federally Qualified Health Centers, LHDs, primary care providers and community-based clinics

(Borges, Pathela, Pirillo, & Blank, 2015; Diaz, Fabre, & Neill, 2012; Guss, Wunsch, McCulloh, Donaldson, & Alverson, 2015; Hale, Smith, Hardin, & Brock-Martin, 2015; Hunte, Alcaide, & Castro, 2010; Kelly, Johnston, & Carey, 2014; Patel et al., 2014). Other providers include STD clinics, family planning facilities and Planned Parenthood, behavioral health agencies, jails and detention centers, churches, schools, and “street-based” approaches through neighborhood centers (Auerswald, Sugano, Ellen, & Klausner, 2016; Belenko, Dembo, Rollie, Childs, & Salvatore, 2009; Borges et al., 2015; Egger, Konty, Borrelli, Cumiskey, & Blank, 2010; Felix et al., 2010; Hoover et al., 2015; Johnson et al., 2013; Prabhu et al., 2011; Sieck & Dembe, 2011; Spauwen, Hoebe, Brouwers, & Dukers-Muijers, 2011). With changes in state legislation and funding, these facilities are meeting the needs of low-income and uninsured populations (August et al., 2016).

The United States Preventive Services Task Force (USPSTF) recommends screening for gonorrhea and chlamydia in sexually active females aged 24 years or younger and in older women who are at increased risk for infection (LeFevre, 2014). Screening methods for these and other STIs can include urine tests, provider and self-collection swabs, blood tests, finger sticks, physical exams, cultures and Pap tests (Sieck & Dembe, 2011). Using screening methods with high specificity and sensitivity allow for early detection and treatment of STDs and infections (LeFevre, 2014).

Early detection and treatment of STDs can reduce many long-term effects, including transmission of such diseases. Local public health systems were found to be influential in combating the spread of STDs (Rodriguez et al., 2012). Prior research has indicated their ability to be effective in surveillance and control of STD rates (Rodriguez et al., 2012). Doubling-up or treating patients during other medical visits, such as HIV treatment and well woman examinations has been found to be effective in the detection, treatment, and prevention of STDs (Ruger, Abdallah, Ng, Luekens, & Cottler, 2014). Klausner, Stanley, and Stansell (2001) have shown screening persons with HIV infections is feasible and acceptable because this population is already receiving care, is easy to identify, and may represent a core group of transmitters. Ruger and colleagues (2014) have determined screening for STDs during well woman examinations is cost effective and educational for the patient.

As part of STD detection and control, partner notification is of great importance (Hogben, Collins, Hoots & O'Connor, 2016). Studies have suggested compensation for STD testing could incentivize participation, but partner notification is still difficult (Auerswald et al., 2016). Rahman, Khan, and Gruber (2015) demonstrated that telephone-based partner notification for gonorrhea and chlamydia (in a program that only did partner notification for syphilis) could be carried out at an increased cost to the STD program of no more than 4.5%. Although partner notification may arouse fears of retaliation, loss of relationships, social stigma, and humiliation it can be a cost-

effective strategy to combat the spread of STDs (Reed et al., 2015).

STDs are a relatively severe threat for Georgia because of high rates compared to national rates. In 2013, Georgia ranked ninth for chlamydial infections, eighth for gonorrheal infections, and first for primary and secondary syphilis in the United States (CDC, 2015; Shah & Madamala, 2015). Studies of cost effectiveness of STD services by the Georgia health departments are non-existent due to lack of information about service delivery arrangements in all 159 counties of Georgia. The present study fills the gap through primary data collection and description of STD service delivery in Georgia health departments. This study also examines variations among these health departments in delivery of STD services. The findings of this study can help identify opportunities for streamlining STD services and maintaining or improving the health of the population served.

METHODS

This study is based on primary survey data collected from 108 (out of 159) county health departments in Georgia. Georgia has 18 separate public health districts, each of which is comprised of one or more of the 159 counties. Each public health district has a District STD Manager who supervises communicable disease specialists (CDSs). The number of CDSs in each district varies, and some CDSs work in multiple counties. For this study, the District STD Managers identified Communicable Disease Specialists and County Nurse Managers (CNMs) from each district.

The survey questionnaire inquired about the STD service delivery arrangement in Georgia county health departments. The questions focused on control of gonorrhea, chlamydia, and syphilis, including investigation, source-of-treatment verification, interviews with clients, partner notification, partnerships with community agencies, methods of screening, and insurance coverage. Using Qualtrics Survey Software, the questionnaire was distributed to District STD/CDS Managers and all identified CDSs and CNMs at all of Georgia's county health departments on February 16, 2015. Two reminders were sent the following week. Individual phone calls and emails were made to encourage completion of the survey. A total of 134 of 159 counties (84% response rate) submitted completed questionnaires by March 1, 2015, the survey closing date.

In some cases, the district lead county submitted a completed questionnaire on behalf of the counties in the district; however, only questionnaires containing individual county responses were included in this analysis. A majority of the respondents (108) were CNMs, representing 80.6 percent of all counties in Georgia. District STD/CDS Manager comprised the second highest category of respondents (19; 14.2%), followed by a small proportion of CDSs and others. To make all responses comparable and accounting for non-response items, the final analytic sample included 108 observations comprising responses from the

county nurse managers. Descriptive statistics were computed using SPSS 23 software.

RESULTS

Screening of STDs

Screening for gonorrhea, chlamydia, and syphilis occurred in all of the surveyed county health departments (n = 108). In addition to screenings conducted in the county health departments, 5.2 percent reported screening in outreach clinics or external clinics and 20.9 percent reported screening in other settings. Few partnerships exist between county health departments and other agencies to deliver STD screening services (16% of the 104 responding health departments) (Table 1). Agencies that had memorandums of agreements (MOAs) or informal agreements with health departments to conduct STD screening included health related organizations (hospitals, FQHCs, community based clinics, Planned Parenthood), behavioral health agencies, jails and detention centers, churches, neighborhood centers, and others.

During the fiscal year 2013-2014, county health departments in Georgia used four tests for screening for gonorrhea and chlamydia in their own clinics. The two most frequently-used tests, both in the health departments and in external settings, were APTIMA urine assays (54.5% of CHD tests) and provider-collected APTIMA swabs (49.3% of CHD tests).

STD Investigations

Sixty-eight percent of the 97 responding county health departments had one or more staff that perform investigations for persons screened positive for STDs. Almost an equal proportion of STD investigations in CHDs were performed by county health department staff (48.9%) and district health department staff (47.2%). Some other community partners performed the remaining 4.8 percent of investigations.

In Georgia, county health departments are funded both by local tax dollars, by state tax dollars, and by federal funds that flow from the Centers for Disease Control and Prevention (CDC) through the state to the health district. On average, 1.7 CDS per CHD were funded locally, while 0.3 CDS per CHD were supported by CDC funds. In addition to the CDSs, an average of 9.2 FTE (full time equivalent) per CHD other staff are engaged in investigations. Among the other staff, an average 6.0 FTE/CHD nursing staff, 1.8 physicians/CHD and 1.4

physicians' assistants (PAs) or advance practice registered nurse (ARNPs)/CHD performed STD investigations.

STD Treatment

Among the 108 counties which responded to this question, partner notification services provided by the county health department staff most commonly included partner treatment at the county health department (71%). Counseling and risk education was the next frequently provided follow up/notification service (61%), followed by outreach or initial contact (38%), and partner identification (35%). Partner identifications were done by other service providers as well.

The demographics of the population subgroups targeted for investigation varied widely. However, roughly 51% of respondents did not provide demographic information. The CHDs provided populations and locations prioritized for investigation. About nine percent of participants indicated "Sex Workers" as additional populations targeted for investigation. Seven percent said "High risk zip code" and seven percent mentioned "migrant workers" as additional populations targeted for investigation.

Average times for CHD to perform treatment verification or to determine if patient is currently treated for condition(s) vary: they range from 88 minutes for private physicians to 37 minutes for emergency department or 38 minutes for hospital. On average, 24 percent of the county health department STD clients had insurance coverage, including Medicaid, Medicare, and private insurance.

STD positive results for which health department staff performed treatment verification by level of priority are shown in Table 2. Participants were requested to indicate treatment verification values (priority) concerning STD positive results, and were asked to select all options that apply (therefore the responses do not add to 100%). Pregnancy-related treatment verification from the emergency department was the most frequent source (77%) followed by CHD clinics (40%). For the treatment verification of neonatal-related STDs cases and youth STDs (ages <16 years), the most frequent sources were private physicians and CHD clinics. CHD clinics were the most frequent sources for cases of treatment verification related to infectious syphilis, latent syphilis, 740/745 diagnosis (late latent), and HIV; CHD clinics were the second most frequent sources for these infections.

Table 1. STD Service delivery arrangement in Georgia County Health Departments

STD Service Delivery Arrangements	N	Mean/proportion	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Screening				
CHD partners with community agencies for STD screening	104	16.3	9.1	23.6
Mean Percentage screened for diagnosis of Gonorrhea/Chlamydia in clinics -Urine Test (Own clinic or internal)	94			
Urine Aptima		54.7	48.9	60.5
Provider collected swab (Aptima)		49.3	43.4	55.3
Self-collected swab (Aptima)		1.6	0.0	4.0
Culture		9.2	0.4	18.0
Mean Percent of Clients screened by method of screening (Outreach clinic or external)	83			
Urine Aptima		25.8	18.2	33.5
Provider collected swab (Aptima)		18.3	12.1	24.5
Self-collected swab (Aptima)		0.9	-	-
Culture		3.0	0.0	6.8
STD Investigations				
Percent of CHDs with one or more staff that perform STD investigations for STD positives	97	68.0	58.6	77.5
Percentage of each type of staff usually perform STD investigations for positives identified	97			
Your County Health Department (CHD) staff		48.9	39.8	58
District Health Department staff		47.2	38.2	56.3
Other		4.9	0.0	14.8
Number of Communicable Disease Specialists (CDS) that are full-time employees working on STD cases by Funded Sources	64			
Funded by State CDC funds		0.3	0.2	0.5
Funded by Local CHD funds		1.7	0.0	4.8
Funded by Grant funds		0.0	0.0	0.1
Other		0.1	0.0	0.2
Other than CDS workers, how many other staff perform STD investigation services	88			
Nurses		6.0	1.7	10.4
PAs/ARNPs		1.4	0.0	2.9
Physicians		1.8	0.6	3.1
Other staff				
Mean estimate of the time (minutes) it takes to do treatment verification	56			
Private Physicians		88.1	15.6	160.5
Emergency Departments		36.6	17.0	56.1
Hospitals		38.1	16.4	59.7
What other populations/locations do you prioritize for investigation	84			
None		50.9	41.3	60.5
Migrant Workers		6.5	1.8	11.2
Sex workers		9.3	3.7	14.8
High-risk zip code		6.5	1.8	11.2
Other		3.7	0.1	7.3
What type of services are normally provided for partner notification/follow-up	108			
Identification		35.2	26.0	44.3
Outreach/initial contact		38.0	28.7	47.3

STD Service Delivery Arrangements	N	Mean/proportion	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Counseling, risk education		61.1	51.8	70.5
Re-interview		18.5	11.1	26.0
Treatment at CHD		71.3	62.6	80.0
Percent of your CHD STD clients that have insurance coverage (including Medicaid, Medicare, and private insurance)	63	24.2	19.4	29.0

Abbreviations: STD, sexually transmitted disease; CHD, county health department; CDC, Centers for Disease Control and Prevention; PAs, Physician's Assistant; ARNP, Advanced Practice Registered Nurse; N, number of observation.

Table 2. Sources of treatment verification, interviews with clients, and partner notification, by type priority populations

Type of STD Services	Private Physicians	Emergency Department	Hospital	CHD Clinic	Outreach Events	Community Agencies	Other
Priority Tier: Sources of STD positive results for which health department staff perform treatment verification							
Pregnancy	22.2	21.3	16.7	40.7	3.7	4.6	0.9
Neonatal	12.0	6.5	8.3	9.3	2.8	1.9	1.9
Younger than 16 years old	22.2	19.4	14.8	51.9	6.5	5.6	0.9
Infectious syphilis	25.0	22.2	20.4	52.8	7.4	6.5	1.9
Latent syphilis	22.2	18.5	17.6	51.9	8.3	6.5	1.9
740/745 diagnosis	6.5	3.7	2.8	14.8	2.8	1.9	2.8
HIV	13.0	10.2	10.2	32.4	7.4	5.6	2.8
Sources of STD positive results for which health department staff performs interviews concerning STD positive results							
Pregnancy	9.3	7.4	4.6	32.4	1.9	2.8	0.9
Neonatal	5.6	2.8	4.6	10.2	0.9	0.9	0.9
Younger than 16 years old	10.2	8.3	6.5	47.2	3.7	3.7	1.9
Infectious syphilis	14.8	13.0	11.1	47.2	4.6	4.6	2.8
Latent syphilis	13.9	12.0	9.3	45.4	4.6	4.6	3.7
740/745 diagnosis	4.6	2.8	2.8	11.1	1.9	1.9	3.7
HIV	8.3	8.3	6.5	35.2	4.6	4.6	3.7
Sources of STD positive results for which health department staff performs partner notification/follow up: (Participants were requested to indicate partner notification values concerning STD positive results)							
Pregnancy	9.3	4.6	3.7	31.5	0.9	0.9	1.9
Neonatal	3.7	1.9	1.9	12.0	0.9	0.9	1.9
Younger than 16 years old	5.6	4.6	3.7	42.6	3.7	1.9	2.8
Infectious syphilis	10.2	9.3	7.4	44.4	4.6	4.6	2.8
Latent syphilis	10.2	9.3	7.4	45.4	4.6	4.6	2.8
740/745 diagnosis	4.6	2.8	2.8	13.9	2.8	1.9	1.9
HIV	7.4	7.4	5.6	31.5	2.8	3.7	1.9

Health department staff also performed interviews about STD positive results from various sources (Table 2). CHD clinics were the leading source for interview cases concerning STD positive results for all sources including pregnancy, neonatal, and youth cases of STDs, as well as for the infectious syphilis, latent syphilis, HIV, and 740/745 diagnosis. Leading sources of positive STD cases for partner notification were CHD clinics, followed by private physicians for all of the priority tiers including pregnancy, neonatal, and youth cases of STDs, as well as for the infectious syphilis, latent syphilis, HIV, and 740/745 diagnosis.

DISCUSSION AND CONCLUSIONS

Our study described patterns of methods for STD screening, disease investigation, and partner notification by county health departments across Georgia. These patterns have not been described in prior studies. Screening for gonorrhea, chlamydia and syphilis was conducted in all of the county health departments. Nationally, a much lower percent of LHDs perform screening, indicating Georgia CHDs may be proactively matching their services with the higher level STD service needs. According to the 2013 National Profile of Local Health Departments, 64 percent of all LHDs across the country provided STD screening service and this proportion is less for the small LHDs with jurisdiction populations of <25,000 (55%) and between 25,000-49,999 people (59%) (Wilhoit, 2013). This is reassuring for communities served by Georgia CHDs given that some STDs, for example chlamydia, can be asymptomatic, and screening is critical for early detection (Workowski, 2015).

Our study showed that partnerships with community organizations were rare among Georgia CHDs in provision of STD services; only 16 percent of responding health departments partnered with others for these services. This may indicate an opportunity for initiatives targeting efficiencies in provision of these services. Partnerships may be critical for health departments in this era of emphasis on social determinants of health and “health in all policies (HiAP)” that may help address health inequities (Shah, Badana, Robb, & Livingood, 2016; Shankardass, Renahy, Muntaner, & O’Campo, 2015; Wernham & Teutsch, 2015). In addition, partnerships can provide a continuity of care to patients while spanning services outside normal service areas.

Our findings about the type of tests, frequency of their use, and type of staff used by CHDs for STD disease screening and investigation can be instrumental in supporting cost-accounting and cost efficiency initiatives. In Georgia, APTIMA urine assays and provider-collected APTIMA swabs were the two most frequently used methods of gonorrhea and chlamydia screening. Most of the responding health departments did not use the self-collected swab or a culture. The majority of STD investigations were performed by district health department staff, but almost half were performed by county health department staff. Communicable disease specialists, if present, performed

STD investigation and were supported by funds from state CDC, and county health department. Nursing staff most frequently performed STD investigations in areas with no communicable disease specialist.

Treatment verification for STDs is critical because for some infections (e.g. gonorrhea), treatment that deviates from current recommended standards (e.g. CDC guidelines) may increase antibiotic resistance. For treatment verification, the emergency department was the most frequent source, followed by CHD clinics. Private physicians and CHD clinics were the most frequent source for treatment verification of neonatal-related STD cases and the youth STDs (ages <16 years). Treatment verification for infectious syphilis, latent syphilis, 740/745 diagnosis, and HIV were most frequently in CHD clinics. The median amount of time for treatment verification, regardless of place, was 54 minutes.

Interviews concerning STD positive results for pregnancy, neonatal, and youth cases of STDs, as well as for infectious syphilis, latent syphilis, HIV, and 740/745 diagnosis were in CHD clinics. Few respondents provide partner notification for all positive STD results in the county. “Only STD positives prioritized for partner notification” and “others” were the least mentioned parameters. CHD clinics, followed by private physicians were the leading sources of positive STD cases for partner notification for all the priority tiers populations including pregnancy, neonatal, and youth cases of STDs, as well as for infectious syphilis, latent syphilis, HIV, and 740/745 diagnosis.

The inconsistency of verification procedures raises questions about the need for improved quality if this is an important service or the need for improved efficiency by reducing this if it is not needed. With the increased accountability of the health care system required by the Affordable Care Act (ACA) and the advent of Accountable Care Organizations and Accountable Health Communities, perhaps quality measures for STD treatment and follow up should be required of the private health care sector, thus reducing the need for the use of precious public sector dollars to assure treatment by the private sector.

Targeted populations for investigation were low socioeconomic, high risk people. However, the most targeted population indicated was “sex workers,” followed by “high risk zip code” and “migrant workers.” A majority of CHDs provide treatment, followed by counseling and risk education, and partner identification as the service provided during the partner notification or follow up process. Sixty-three of the county health departments indicated some CHD STD clients were insured, including Medicaid, Medicare, and private insurance. With this insurance support, further questions arise concerning the effectiveness of CHDs in recovering costs of STD care from insurance or why the CHD would provide services that are being reimbursed to the private health care sector. The need for public sector support for the uninsured would clearly be needed, but ACA

expansion of insurance should reduce the requirement for public sector expenditures for these services.

The limitation of this study was the use of self-reported data. Although self-reported data can provide insight for a survey, it can be subject to missing responses, recall bias and incomplete information. The data showed extensive variations but do not explain why there were variations. This will require a more in-depth study, particularly to clarify opportunities for improved quality and efficiency. The fact that some STD service delivery was based more on district support while some was based more on CHD support, reduced the comparability of data.

Variances regarding diagnostic methodologies, work time expenditures, and staff responsibilities within CHDs have likely had an influence on the delivery of STD services across Georgia's county health departments. The numerous deviations among administrative practices, in providing STD screening, investigations and treatment, and indicate a lack of standardization which has evident implications among Georgia's county health departments. Streamlining opportunities were present as a reflection of the health departments' notable absence of administrative uniformity.

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