Validation of Data Collection for the HEDIS Performance Measure on Chlamydia Screening in an MCO

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Objective: To determine the validity of calculating the chlamydia Health Plan Employer Data and Information Set (HEDIS) measure using administrative data available in a mixed-model managed care organization (MCO).

Study Design: Retrospective cohort study.

Methods: A review of *International Classification of Diseases, Ninth Revision (ICD-9), Current Procedural Termin-ology (CPT),* Healthcare Common Procedure Coding System (HCPCS), and National Drug Code codes and electronic laboratory files in 1998 and a medical chart review to validate sexual activity and chlamydia testing codes specified by the National Committee for Quality Assurance (NCQA) in 1999 for the chlamydia HEDIS 2000 measure.

Results: Fewer than 25% of female enrollees with laboratory evidence of a chlamydia test had a *CPT* code for chlamydia testing as specified by the NCQA. Non–pathogen-specific test codes instead of NCQA-specified codes were used in 1998 to code chlamydia tests. By incorporating electronic laboratory data into the automated claims-generating process, all chlamydia tests performed at staff-model clinics were coded. Use of pharmacy dispensing data to identify contraceptive prescriptions increased the proportion of enrollees classified as sexually active by 4% to 5% vs documentation of sexual activity using *ICD-9, CPT,* and HCPCS codes only.

Conclusions: The MCO quality assurance specialists examining chlamydia testing rates under HEDIS may want to evaluate chlamydia testing coding practices in their MCOs to determine whether simple changes in coding practices may present a more accurate picture of actual testing practices. The proportion of female enrollees classified as sexually active using different data available in the staff and network models varied only slightly.

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Chlamydia is the most common bacterial sexually transmitted disease in the United States, with an estimated 3 million new infections each year.[1] Approximately 79% of the burden of chlamydial infection in the United States involves females.[2] Among cases of chlamydial infection in female patients reported to the Centers for Disease Control and Prevention in 1995, 46% were aged 15 to 19 years and 33% were aged 20 to 24 years.[3] In their 1993 guidelines on chlamydia, the Centers for Disease Control and Prevention estimated that as many as 40% of females with chlamydial infection will develop pelvic inflammatory disease[4,5]; of those, an estimated 20% will become infertile, almost 20% will experience chronic pelvic pain, and nearly 10% will have an ectopic pregnancy.[6-20] The risk of HIV acquisition and transmission is 2 to 4 times higher in females with chlamydial infection vs uninfected females.[21,22]

Chlamydia screening of adolescent girls and young women became a performance measure in the Health Plan Employer Data and Information Set (HEDIS) in 2000. The HEDIS is a voluntary performance measurement program developed by the National Committee for Quality Assurance (NCQA), whose mission is to improve the quality of care provided by managed care organizations (MCOs). The measure estimates the percentage of sexually active female enrollees aged 16 through 26 years (as of December 31 of the measurement year and thus 15-25 years old during the previous year in which screening is assessed) who were continuously enrolled in a single MCO in the measurement year and who had at least 1 test for chlamydia during that measurement year. In 1999, the NCQA provided MCOs with a list of *International Classifica-tion of Diseases, Ninth Revision (ICD-9); Current Procedural Terminology (CPT)*; and National Drug Code (NDC) pharmacy codes for health services that were to be used to classify enrollees as sexually active. These codes include Papanicolaou smears, pelvic examinations, contraceptive prescriptions, pregnancy-related services, and screening and treatment for sexually transmitted diseases. The NCQA also provides a list of *CPT* codes to be used to identify chlamydia testing.

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Table 1. Selection of the Study Sample

	Female Enrollees, No. (%) (n = 71 994)*
Female enrollees excluded owing to:	
More than a 1-month gap in medical coverage in 1998	27 067 (37.6)
More than a 1-month gap in pharmacy coverage in 1998	1906 (2.6)
Received services from clinics outside the managed care organization during 1998	175 (0.2)
Received services from both staff- and network-model clinics during 1998	1275 (1.8)
Sample eligible for analysis	41 571 (57.7)
Received services from staff-model clinics during 1998	12 850 (31)
Received services from network-model clinics during 1998	28 721 (69)

*Female enrollees with a birth date between January 1, 1972, and December 31, 1982.

This project was designed to evaluate the feasibility and validity of using the NCQA specifications[23] to correctly estimate the extent of chlamydia testing of sexually active adolescent girls and young women in MCOs. To do so, we calculated the measure using administrative data, ie, *ICD-9*, *CPT*, and Healthcare Common Procedure Coding System (HCPCS) codes; centralized electronic pharmacy and laboratory data; and medical records that were available in a staff and network model in a single MCO in the Midwest.

METHODS

Study Environment

We reviewed claims, laboratory, and pharmacy dispensing data and medical records in a mixed-model MCO for 1998. This MCO served 463 865 female enrollees and 427 333 male enrollees in a metropolitan area in the Midwest. The staff-model clinics served 254 608 persons in 20 staff-model clinics. The network-model clinics served 613 559 persons through a network of 568 contracted primary care clinics. The remaining 23 031 persons either had switched their primary care affiliation between staff model and network model in 1998 or had a primary care affiliation other than the staff or network model.

There are 2 distinct service components to the MCO: staff-model clinics, where the clinics are owned by the MCO, and network-model (contracted) clinics, where the MCO has made a financial arrangement so that enrollees can receive care at the contracted clinics. Physicians at both the staff- and network-model clinics are reimbursed on a capitated basis, and chlamydia tests are directly billed through the laboratories at the staff- and network-model clinics. For most employers using this MCO, employee copays are higher in network-model clinics. In 1998, clinicians at staff-model clinics were paid strictly on salary, and most physicians at network-model clinics were paid according to the physician's productivity. In staff- and network-model clinics, an obstetrics and gynecology physician was not routinely allowed to be a primary care physician. The most significant difference between staff- and network-model clinics was the availability of unified electronic physician notes and laboratory data in the staff model but not in the network model. Claims, enrollment, and pharmacy dispensation information are available in a centralized analytic data warehouse for all enrollees of the staff and network models. An unlimited number of *ICD-9* diagnosis, *CPT*, and HCPCS procedure codes can be recorded at any single encounter in this MCO.

Study Population

Among the female enrollees, 348 527 had no more than a 1-month gap in coverage in 1998. A total of 41 571 female enrollees with a birth date between January 1, 1972, and December 31, 1982 (aged 16-26 years and thus aged 15-25 years during the previous year when screening was assessed), who had no more than a 1-month gap in 1998 coverage and received primary care services in either the staff or network model during that period were included in the study (**Table 1**). The pharmacy coverage for all female enrollees in this MCO included contraceptives.

Estimates of Sexual Activity

To identify sexually active females, we identified 22 724 female en-rollees with *ICD-9*, *CPT*, and NDC codes for sexual health services specified by the NCQA.[23] These codes were selected according to 4 cat-

egories: (1) Papanicolaou smears and pelvic examinations; (2) contraceptive prescriptions; (3) pregnancy-related services; and (4) screening and treatment for sexually transmitted diseases. We also identified additional *ICD-9*, *CPT*, NDC, and HCPCS codes that might reflect sexual activity but that were not specified by the NCQA (**Table 2**). We reviewed the compiled list of *ICD-9*, *CPT*, and NDC pharmacy codes, including codes specified by the NCQA and in Table 2, to determine which are clearly indicators of current sexual activity and which "possibly" reflect current sexual activity. We defined the former as "definite" indicators and the latter as "questionable" indicators. The questionable indicators from *CPT* and HCPCS procedure codes and from *ICD-9* diagnosis codes are given in **Table 3** and **Table 4**, respectively. We then reviewed the 1998 administrative data (ie, *ICD-9*, *CPT*, and HCPCS codes) and centralized electronic pharmacy and laboratory data of all enrollees and determined that all but 961 enrollees had at least 1 definite indicator for current sexual activity. We then reviewed electronic physician notes and paper medical records of these 961 enrollees with questionable codes only for documented evidence of sexual activity. The medical records of 110 enrollees (11.4%) were not available for review. Of the remaining 851 enrollees, 154 (18.1%) were randomly chosen and reviewed by 2 or more professional medical chart auditors for quality assurance.

Table 2. Codes Used to Identify Sexually Active Female Enrollees Aged 15 Through 25 years That Were Not Specified by the NCQA[23]*

Sexually Active Enrollees Identified, Code Number, and Description	Total	With a Code for Sexual Activity Not Specified by the NCQA*
***ICD-9* Diagnosis Codes**	522	11
078.11: Condyloma acuminatum		
V65.44: HIV counseling		
V65.45: Counsel on other sexually transmitted disease		
V73.89: Screening for other specified viral diseases		
HCPCS Procedure Codes	2789	52
A4260: Levonorgestrel implant		
J0696: Ceftriaxone sodium injection		
J1055: Medroxyprogesterone acetate injection		
J2790: Rhocrine immune globulin injection		
J7300: Intraut copper contraceptive		
NDC Pharmacy Codes†	833	80
00008253605: Triphasil-28 tablets		
00025025924: Norinyl 1+35 tablets		
00025026524: Norinyl 1+50 tablets		
00025027424: Tri-norinyl-28 tablets		
11926022112: Encare oval vag supps, 100 mg		
Laboratory Tests	4557	83
Papanicolaou smears		
Pregnancy-related tests: human chorionic gonadotrophin, obstetrics, antibody screen, maternal serum alpha-fetoprotein		
Screening for Sexually Transmitted Diseases		
Genital test, chlamydia, syphilis, *Neisseria gonorrhoeae*, HIV antibody, *Varicella zoster*/herpes simplex culture; herpes simplex antigen		

NCQA indicates National Committee for Quality Assurance; *ICD-9, International Classification of Diseases, Ninth Edition*; HCPCS, Healthcare Common Procedure Coding System; NDC, National Drug Code; HEDIS, Health Plan Employer Data and Information Set.
*These sexually active female enrollees were not identified by any codes in the *ICD-9, Current Procedural Terminology*, and NDC code lists used to identify sexually active individuals in the HEDIS 2000 chlamydia screening in women.
†NDC codes with American Hospital Formulary Service classes of contraceptive devices (320 000) and contraceptives (681 200) were not listed in the NDC code list of the HEDIS 2000 chlamydia screening in women.[23]

We estimated the number of female enrollees who were continuously enrolled, sexually active, and aged 15 to 25 years in 1998 using 3 different combinations of data sources: (1) claims data only, using *ICD-9*, *CPT*, and HCPCS codes specified by the NCQA[23] and in Table 2; (2) claims and pharmacy dispensing data using *ICD-9*, *CPT*, HCPCS, and NDC codes specified by the NCQA[23] and in Table 2; and (3) claims, pharmacy, and laboratory data using *ICD-9*, *CPT*, HCPCS, and NDC codes specified by the NCQA[23] and in Table 2.

Estimate of Chlamydia Testing

We estimated chla-mydia testing of female enrollees classified as sexually active by NCQA-specified codes

Table 3. Proportion of 41 571 Female Enrollees With a Procedure-Related Questionable Indicator of Sexual Activity Who Were Classified as Sexually Active by the Existence of a Definite Indicator of Current Sexual Activity or by Medical Record Review

CPT or HCPCS Code	Description	Female Enrollees, No. (%)	
		Total	Sexually Active
56405	Incision and drainage of vulva/perineum	4	3 (75)
56420	Drainage of gland abscess	7	5 (71)
59200	Insert cervical dilator for dilation and curettage or delivery diagnosis	57	57 (100)
76830	Echo examination, transvaginal for diagnosis of uterine abnormality or pregnancy	673	657 (98)
83516	Immunoassay, nonantibody;* qualitative or semiquantitative; multiple-step method	22	13 (59)
83518	Immunoassay, nonantibody;* qualitative or semiquantitative; single-step method	64	54 (84)
83519	Immunoassay, quantitative;* by radiopharmaceutical technique	30	24 (80)
83520	Immunoassay, not otherwise specified*	36	27 (75)
86225	DNA antibody*	75	62 (83)
86631	Chlamydia, antibody	26	26 (100)
86632	Chlamydia, IgM, antibody	1	1 (100)
88160	Cytopath smear, other source, screening and interpretation	8	8 (100)
88161	Cytopath smear, other source, preparation, screening, and interpretation	5	5 (100)
88162	Cytopath smear, other source, involving >5 slides	4	2 (50)
J0696	Ceftriaxone sodium injection for *Neisseria gonorrhoeae*	294	265 (90)

CPT indicates *Current Procedural Terminology*; HCPCS, Healthcare Common Procedure Coding System.
*Non–pathogen-specific tests.

using 3 different data sources: (1) claims data using *CPT* codes specified by the NCQA,[23] (2) claims data using *CPT* codes specified by the NCQA[23] and *CPT* codes 87178 and 87797; and (3) claims data using *CPT* codes specified by the NCQA,[23] *CPT* codes 87178 and 87797, and electronic laboratory data.

The retrospective review determined the total number of female enrollees aged 15 to 25 years in the staff and network models in 1998 as well as the HEDIS algorithm calculation of numerator (number of females tested for chlamydia) and denominator (number of females who are sexually active) for each type of plan. The medical chart review identified truly sexually active females aged 15 to 25 years and validated the numerator and denominator calculations.

These denominator and numerator calculations were used to (1) evaluate the impact of electronic laboratory data on the denominator and numerator calculation of the measure; (2) determine whether there were significant variations in denominator and numerator estimates between the staff and network models that have different data available; and (3) examine the impact of benefit coverage for oral contraceptives or contraceptive devices in determining the number of sexually active female enrollees. Pharmacy coverage in the MCO included contraceptives for all female enrollees in the staff and network models. By calculating the proportion of female enrollees classified as sexually active with and without NDC pharmacy codes, we examined how benefit coverage for oral contraceptives affects classification of enrollee sexual activity.

RESULTS

Table 2 depicts diagnostic, procedural, pharmacy, and laboratory test codes used to identify sexually active female enrollees from avail-able administrative data that were not listed in NCQA specifications.[23] Numerous enrollees were classified as sexually active using additional codes for laboratory tests (4557 enrollees), HCPCS procedure codes (2789 enrollees), contraceptive prescription codes (833 enrollees), and *ICD-9* codes for sexually transmitted disease or HIV diagnosis or counseling (522 enrollees). When we

excluded female enrollees who were classified as sexually active by a code specified by the NCQA, the additional codes collectively resulted in classifying 207 female enrollees (1%) as sexually active.

Twenty-nine percent (95% confidence interval [CI], 26.4%-32.2%) of enrollees with a diagnosis code for viral warts (*ICD-9* code 078.19) had documentation of palmar or plantar warts only and thus could not be classified as sexually active using this diagnostic code alone. Forty-one percent (95% CI, 20.4%-61.5%) of enrollees with a procedure code of immunoassay, nonantibody, qualitative or semiquantitative, multiple-step method (for a nonspecified pathogen) (*CPT* code 83516) had no evidence of sexual activity in their medical records. Ninety-nine percent (95% CI, 99.0%-99.3%) of enrollees who underwent a gynecologic examination (*ICD-9* code V72.3) had evidence of sexual activity in their medical records. Ninety-eight percent (95% CI, 97.1%-99.6%) of enrollees with a diagnosis code of other specified viral disease (*ICD-9* code V73.89) and 90% (95% CI, 86.7%-93.5%) of enrollees with a procedure code for a ceftriaxone sodium injection (HCPCS code J0696) had evidence of being sexually active in their medical records. The *ICD-9* codes 078.19 and V72.3 and *CPT* code

Table 4. Proportion of 41 571 Female Enrollees With a Diagnosis-Related Questionable Indicator of Sexual Activity Who Were Classified as Sexually Active by the Existence of a Definite Indicator of Current Sexual Activity or by Medical Record Review

ICD-9 Code	Description	Female Enrollees, No. (%)	
		Total	Sexually Active
042	HIV disease	3	3 (100)
054.10	Unspecified genital herpes	105	103 (98)
054.12	Herpetic ulcer of vulva	4	4 (100)
054.19	Other genital herpes	3	3 (100)
078.19	Other specified viral warts	952	673 (71)
079.4	Human papilloma virus	40	40 (100)
079.88	Other specified chlamydial infection	10	10 (100)
079.98	Unspecified chlamydial infection	81	81 (100)
091.3	Secondary syphilis of skin or mucous membranes	7	7 (100)
094.0	Tabes dorsalis	1	0
094.89	Other neurosyphilis	1	0
097.1	Unspecified latent syphilis	2	2 (100)
097.9	Unspecified syphilis	1	1 (100)
098.2	Chronic gonococcal infections of lower genitourinary tract	1	1 (100)
099.50	*Chlamydia trachomatis*, unspecified site	6	6 (100)
099.59	*Chlamydia trachomatis*, other specified site	1	1 (100)
614.1	Chronic salpingo-oophoritis	6	6 (100)
614.6	Female pelvic peritoneal adhesions	49	46 (94)
615.1	Chronic uterine inflammation	2	2 (100)
615.9	Uterine inflammation, unspecified site	38	38 (100)
616	Inflammatory disease of cervix, vagina, and vulva	13	12 (92)
616.0	Cervicitis	210	207 (99)
616.1	Vaginitis	26	24 (92)
616.10	Vaginitis and vulvovaginitis	3032	2935 (97)
616.11	Vaginitis and vulvovaginitis in diseases classified elsewhere	5	5 (100)
616.2	Bartholin gland cyst	27	24 (89)
616.3	Bartholin gland abscess	11	10 (91)
616.4	Other abscess of vulva	29	26 (90)
616.50	Unspecified ulceration of vulva	11	9 (82)
616.8	Other specified female genital inflammation	12	12 (100)
616.9	Unspecified female genital inflammation	25	25 (100)
V08	Asymptomatic HIV status	5	5 (100)
V25.3	Menstrual extraction	4	4 (100)
V72.3	Gynecologic examination	10 465	10 375 (99)
V73.8	Screening for other specified viral/chlamydial diseases	14	14 (100)
V73.89	Screening for other specified viral diseases	424	417 (98)
V76.2	Screening for malignant neoplasm-cervix	2750	2721 (99)

ICD-9 indicates *International Classification of Diseases, Ninth Edition*.

83516 were included in the NCQA specifications,[23] whereas *ICD-9* code V73.89 and HCPCS code J0696 were not.

Of 43 021 enrollees who had no more than a 1-month gap in medical and pharmacy coverage, 175 (0.4%) received primary care services from clinics that were other than staff- or network-model clinics and 1275 (3.0%) obtained primary care services from both staff- and network-model clinics in 1998 (Table 1). These enrollees were excluded from the analysis of chlamydia testing rates and sexual activity rates of enrollees. Of the remaining 41 571 female enrollees analyzed, the staff model served 12 850 (31%) and the network model served 28 721 (69%).

The proportion of female enrollees classified as sexually active was 4% higher in the staff model than in the network model using *ICD-9*, *CPT*, HCPCS, and NDC codes and electronic laboratory data (**Figure 1**). The difference in proportions of sexual activity was most apparent in enrollees aged 18 to 21 years. Benefit coverage for oral contraceptive or contraceptive devices identified an additional 4% to 5% of sexually active female enrollees overall (data not shown). The effect of contraceptive coverage on increasing the proportion of female enrollees classified as sexually active was greatest in those aged 20 to 26 years. Electronic laboratory data were available to document testing in the 20 staff-model clinics; use of these data increased the proportion of enrollees classified as sexually active by only 1%.

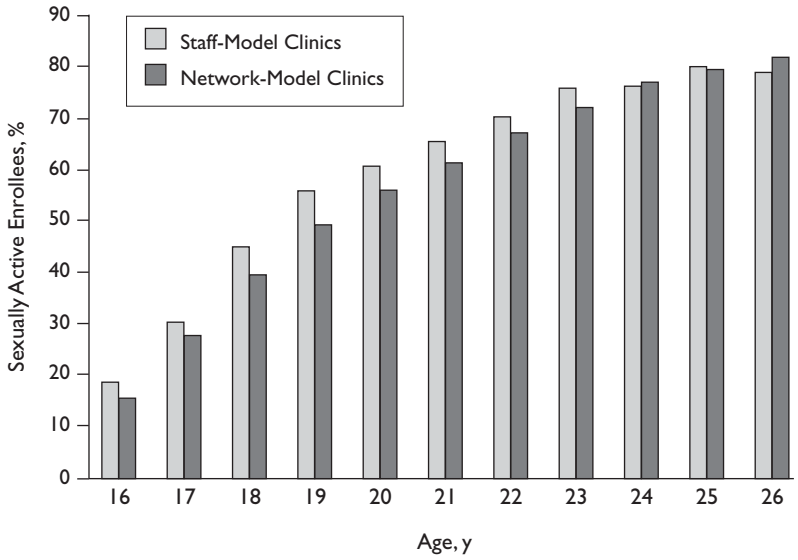
Fewer than 25% of enrollees with evidence of a chlamydia test in the electronic laboratory data had a *CPT* code for chlamydia testing (87320, 87270, 87110, 87490, 87491, or 87810) that was specified by the NCQA (**Table 5**).[23] All chlamydia tests identified in the electronic laboratory data and not associated with a *CPT* code for chlamydia testing as specified by the NCQA[23] were coded with 1 or more non–pathogen-specific test codes that may have been used by some clinicians to code chlamydia testing (*CPT* code 87178 for microbial identification with nucleic acid probe and 87797 for detection by DNA or RNA using a direct probe technique) (**Table 6**). The chlamydia test rate in staff-model clinics was 35%, which was almost twice the rate in network-model clinics (18%) in 1998 (**Figure 2**).

CONCLUSIONS

In 2000, the NCQA requested that MCOs report on a HEDIS performance indicator to measure the rate of chlamydia testing in 1999 among sexually active females aged 15 to 25 years.[24] This study was designed to determine the validity and feasibility of calculating the chlamydia HEDIS measure using administrative data available in staff- and network-model MCOs.

We found that >75% of staff-model enrollees with electronic laboratory data evidence of a chlamydia test had no evidence of a *CPT* code for chlamydia testing as specified by the NCQA in their administrative records. This could result in underrepresentation of actual chlamydia screening rates in MCOs, which may have been reflected in the first year of the chlamydia HEDIS measure, when national screening rates across staff and network plans were <20%. The MCO quality assurance specialists examining chlamydia testing rates under HEDIS may want to evaluate chlamydia test coding practices in their MCOs to determine whether simple changes in coding prac-

Figure 1. Percentage of Female Enrollees Aged 15 to 25 years Classified as Sexually Active by Staff- and Network-model Clinics in 1998. This Percentage Was Statistically Significant Between Staff- and Network-model Clinics ($P < .0001$)



tices may present a more accurate picture of actual testing practices.

This discrepancy reflected the coding practices used by staff-model clinics of this particular MCO in 1998. The staff-model clinics used DNA (nonamplified probe) tests (GenProbe Inc, San Diego, Calif) for chlamydia testing in 1998 and switched to polymerase chain reaction tests (Roche, Switzerland) in December 1999. The non–pathogen-specific test codes 87178 and 87797 for nucleic acid probe tests were used exclusively at staff-model clinics in 1998 to code chlamydia DNA probe tests. These *CPT* codes were replaced at staff-model clinics by *CPT* code 87270 (direct fluorescent antibody technique) in November 1998 and then by *CPT* code 87491 (amplified probe technique) in December 1999. All chlamydia tests performed at staff-model clinics in 1998 without an NCQA-specified *CPT* code for chlamydia testing were coded using *CPT* codes 87178 or 87797 (Table 6). A similar coding pattern was observed in the network-model clinics.

All chlamydia tests performed at staff-model clinics were 100% coded with either an NCQA-specified *CPT* code or *CPT* code 87178 or 87797. This success rate was accomplished by incorporating electronic laboratory data into the automated claims-generating process. Since coding of chlamydia tests may represent a threat to confidentiality concerns between an adolescent patient and her physician, physicians may opt for less specific coding to reduce the likelihood that a parent would recognize a test for a sexually transmitted disease. Incorporation of electronic laboratory data into the automated claims-generating process ensures that all chlamydia tests were coded. Since electronic laboratory data were not available for the network-model clinics, it is not clear whether all chlamydia tests performed at these clinics were coded to reflect a chlamydia test.

Table 5. Documentation of a Chlamydia Test in the Electronic Laboratory Data for Sexually Active Female Enrollees With NCQA-specified *CPT* Codes for Chlamydia Testing

Evidence of a Chlamydia Test in the Electronic Laboratory Data	NCQA-Specified *CPT* Codes for Chlamydia Testing	
	No	Yes
Staff-model clinics		
No	4636	50
Yes	1924*	559
Subtotal	**6560**	**609**
Network-model clinics		
No	14 094	920
Yes	30	20
Subtotal	**14 124**	**940**

NCQA indicates National Committee for Quality Assurance; *CPT, Current Procedural Terminology.*
*All chlamydia tests identified in the electronic laboratory data and not associated with a *CPT* code for chlamydia testing as specified by the NCQA[23] were coded with 1 or more non–pathogen-specific codes (87797 or 87178).

Table 6. Proportion of Sexually Active Female Enrollees Receiving Chlamydia Tests With Non–pathogen-specific *CPT* Coding

	Network-Model Clinics	Staff-Model Clinics
Sexually active female enrollees, No.	15 064	7139
Chlamydia tests, No. (%)*	2638 (18)	2524 (35)
With NCQA-specified *CPT* codes	940 (36)	609 (24)
With non–pathogen-specific *CPT* codes of 87797 or 87178	1698 (64)	1915 (76)

CPT indicates *Current Procedural Terminology*; NCQA, National Committee for Quality Assurance.
*Identified using *CPT* codes specified by the NCQA,[23] *CPT* codes 87178 and 87797, and electronic laboratory data.

Our findings are consistent with those of Mangione-Smith et al,[25] who found that chlamydia testing rates based on *CPT* codes for chlamydia tests available in 1997 indicated that a very low percentage of adolescent girls and young women were tested. Mangione-Smith et al found that only 8% of females who were not identified by a *CPT* code had documentation of a chlamydia test

in their medical records in 4 health plans, and chlamydia screening rates varied across the 4 plans from 2% to 42%. Compared with our study, that of Mangione-Smith et al was designed as a feasibility study and had a much smaller sample size.

Our study demonstrates that plans that did not provide coverage for contraceptive prescriptions classified 5% fewer female enrollees as sexually active than plans that provided such coverage. Our study suggests that plans that do not cover contraceptives will only slightly underestimate the number of sexually active female enrollees who can benefit from chlamydia screening. Our findings are consistent with those of Mangione-Smith and colleagues,[25] who found that only 2% to 11% of adolescent girls and young women who were not classified as sexually active by the NCQA-specified codes had evidence of sexual activity in their medical records.

In our study, >90% of enrollees with an *ICD-9* diagnosis code of V73.89 (other specified viral diseases) or an HCPCS code of J0696 (ceftriaxone sodium injection) had evidence of sexual activity in their medical records. The addition of these codes to NCQA specifications may identify additional sexually active females who may benefit from chlamydia screening. The NCQA may also want to reconsider the use of *ICD-9* diagnosis code 078.19 (viral warts) and *CPT* procedure code 83516 (non–pathogen-specific, immunoassay, nonantibody) to classify sexual activity; in our analysis, 29% to 41% of female enrollees with one of these codes had no evidence of sexual activity. In addition, use of the *ICD-9*, HCPCS, and NDC codes listed in Table 2 to classify sexual activity needs further evaluation; in this study, these codes collectively classified 207 additional female enrollees (1%) as sexually active who were not classified as such using NCQA codes.

Our findings may be influenced by access to an unlimited number of *ICD-9*, *CPT*, and HCPCS codes per encounter that could be used to classify sexual activity or chlamydia testing. In MCOs that limit the number of diagnosis and procedure codes that may be recorded per encounter, the proportion of female enrollees classified as sexually active and the proportion classified as having a chlamydia test may be lower. A limitation of this study is the use of medical records as the "gold standard" for sexual activity. The likelihood of recording sexual activity for a female varies by reason for the encounter. A more appropriate gold standard would be asking the individual directly, preferably in an ongoing, prospective fashion. The use of medical records could lead to an underestimation of the population of females who are sexually active.

The chlamydia testing rate of staff-model clinics was almost twice that of network-model clinics in 1998 (35% vs 18%). Although the cost of chlamydia testing may be higher for the network model than for the staff model, the difference in testing rates was likely largely due to the difference in practice patterns. In contrast to staff models, network models serve a much larger number of enrollees and have a geographically dispersed and often fragmented population of providers who may have very different practice patterns. In addition, staff physicians were salaried, whereas the others were paid according to productivity; this could affect practice patterns.

Findings from this study demonstrate the importance of evaluating the administrative data codes used to calculate HEDIS performance measures. Accurate coding of *ICD-9*, *CPT*, and HCPCS codes used in the denominator (the number who are sexually active) and numerator (the number tested) to calculate the chlamydia HEDIS measure may assist MCOs in making HEDIS scores more accurately reflect actual performance. Periodic medical

Figure 2. Percentage of Sexually Active Female Enrollees Aged 15 to 25 Years Who Had Evidence of Chlamydia Testing Using Current Procedural Terminology Codes Specified by the National Committee for Quality Assurance, Current Procedural Terminology codes 87178 and 87797, and Electronic Laboratory Data

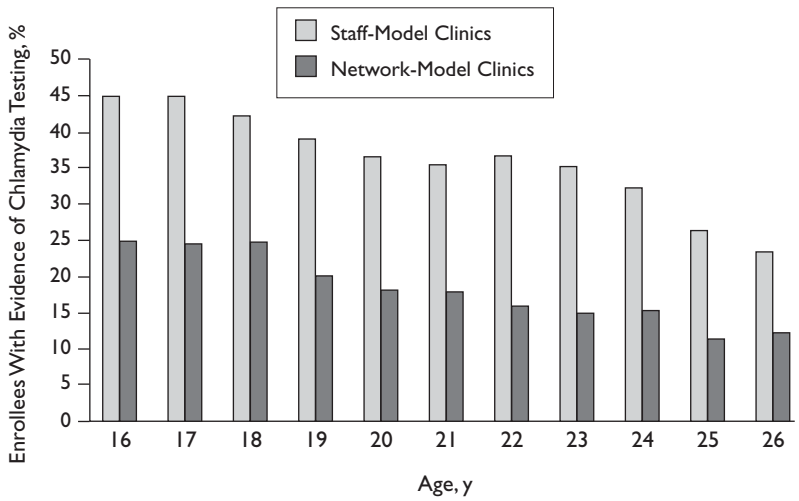


chart reviews and assessments of clinicians' coding practices can be used to evaluate potential reasons for incomplete or inaccurate coding. In addition, we encourage MCOs to share their experience with coding practices with the NCQA so that the NCQA can refine the current specifications to reflect the most accurate calculations of HEDIS measures.

Acknowledgments

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