NYC MACROSCOPE
ELECTRONIC HEALTH RECORD SURVEILLANCE INDICATOR FACT SHEET

Hypertension (diagnosis)

INDICATOR DEFINITION
2013 NYC Macroscope

Numerator: Patients with an ICD-9 code for hypertension in their electronic health record (EHR) problem list or assessment section during or prior to 2013

Denominator: Patients with a visit in 2013

2013-14 NYC Health and Nutrition Examination Survey (HANES) and 2013 Community Health Survey (CHS)

Participants who reported being told by a doctor or other healthcare professional that they had high blood pressure *and* reported seeing a doctor or other healthcare professional in the last 12 months for primary care

SUMMARY

The NYC Macroscope estimate of hypertension prevalence using the diagnosis indicator was statistically equivalent to estimates from NYC HANES and CHS. There was moderate to high sensitivity and high specificity of this indicator when comparing NYC HANES participants' EHRs with their survey responses.

RECOMMENDATION FOR USE

Recommended

Prevalence and comparisons by data source

Prevalence estimates of hypertension using the diagnosis indicator were 32.3% in the NYC Macroscope, 32.5% in NYC HANES, and 31.6% in CHS. The prevalence estimate from the NYC Macroscope was statistically equivalent to estimates from NYC HANES and CHS ($p<0.01$ for both comparisons). The hypertension diagnosis indicator met all five a priori criteria for agreement when comparing the NYC Macroscope with NYC HANES and CHS.

Prevalence and comparison statistics for hypertension (diagnosis) in NYC Macroscope, NYC HANES, and CHS

	2013 NYC Macroscope	2013-14 NYC HANES	2013 CHS
Total sample size	N=594,291	N=1,135	N=6,155
Prevalence, % (95% CI)	32.3% (32.2%, 32.4%)	32.5% (29.4%, 35.7%)	31.6% (30.2%, 33.0%)
NYC Macroscope providers reporting data, n (%)	380 (97%)		
NYC Macroscope patients with missing data, n (%)	NA*		

Table adapted from Thorpe LE, McVeigh KH, Perlman SE, et al. Monitoring prevalence, treatment, and control of metabolic conditions in New York City adults using 2013 primary care electronic health records: A surveillance validation study. eGEMS. 2016;4(1):28. DOI: http://dx.doi.org/10.13063/2327-9214.1266.

CI, confidence interval; NA, not applicable.

*Not applicable because lack of an ICD-9 code for hypertension was defined as "no hypertension."

Prevalence comparison of hypertension (diagnosis) for NYC Macroscope vs. NYC HANES and CHS

Prevalence comparison statistics (a priori criterion for agreement)	2013 NYC Macroscope* vs. 2013-14 NYC HANES Value (meets criterion?)	2013 NYC Macroscope† vs. 2013 CHS Value (meets criterion?)
Absolute difference (<5%)	1.5% (Yes)	0.7% (Yes)
Prevalence ratio (0.85–1.15)	1.00 (Yes)	1.02 (Yes)
Two-tailed t-test (p-value ≥0.05)	p=0.93 (Yes)	p=0.33 (Yes)
Two one-sided t-tests (p-value <0.05)	p<0.01 (Yes)	p<0.01 (Yes)
Spearman's rank correlation of age- and sex-stratified estimates (r ≥0.80)	r=1.00 (Yes)	r=1.00 (Yes)

Table adapted from Thorpe LE, McVeigh KH, Perlman SE, et al. Monitoring prevalence, treatment, and control of metabolic conditions in New York City adults using 2013 primary care electronic health records: A surveillance validation study. eGEMS. 2016;4(1):28. DOI: http://dx.doi.org/10.13063/2327-9214.1266.

*NYC Macroscope estimates were weighted to NYC HANES in-care population.

†NYC Macroscope estimates were weighted to CHS in-care population.

Prevalence by data source, sex, and age group

Among men and women 60 years of age and older, the NYC Macroscope prevalence estimates for hypertension using the diagnosis indicator were significantly higher compared with NYC HANES estimates (men: 70.2% vs. 59.4%, p=0.02; women: 73.2% vs. 61.2%, p<0.01) and CHS (men: 70.2% vs. 63.4%; p<0.01; women: 73.2% vs. 67.7%; p<0.01).

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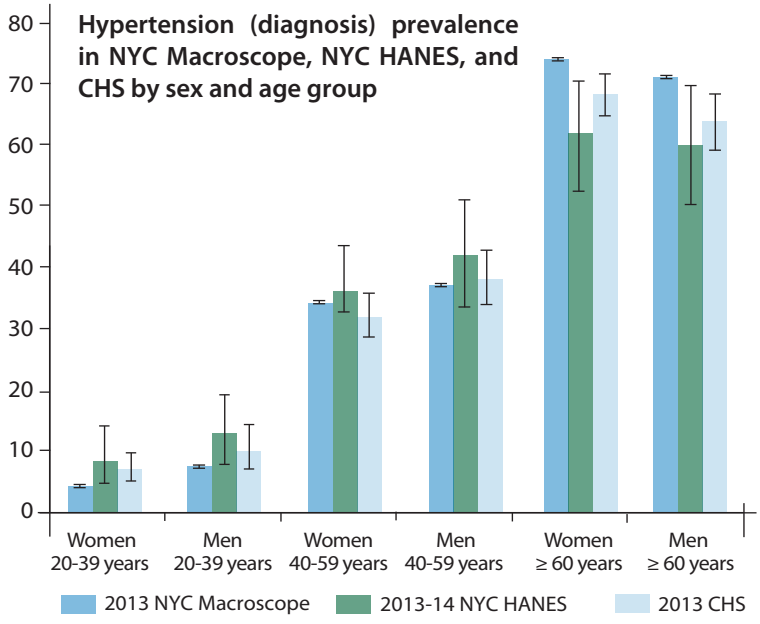
In addition, the NYC Macroscope estimate was significantly lower compared with the CHS estimate among women between 20 and 39 years of age (4.8% vs. 7.5%; p<0.01). No other comparisons of stratified estimates were significantly different.



Error bars represent 95% confidence intervals.

Indicator validity

In the sample of NYC Macroscope practice EHRs (N=48), there was near perfect agreement, high sensitivity, and high specificity. In the sample of non-NYC Macroscope practice EHRs (N=142), there was substantial agreement, moderate sensitivity, and high specificity. When restricting this group to a subsample of practices that attested to Stage 1 Meaningful Use (N=86), there was also substantial agreement, moderate sensitivity, and high specificity.

Validity of hypertension indicator (diagnosis) in a sample of EHRs from NYC HANES participants

	NYC Macroscope practice EHRs	Non-NYC Macroscope practice EHRs	
		All	Stage 1 Meaningful Use*
	N=48	N=142	N=86
Kappa coefficient	1.00	0.72	0.79
Sensitivity (95% CI)	1.00 (0.78, 1.00)	0.79 (0.65, 0.89)	0.89 (0.72, 0.98)
Specificity (95% CI)	1.00 (0.89, 1.00)	0.92 (0.85, 0.97)	0.91 (0.81, 0.97)
Positive predictive value	1.00	0.85	0.83
Negative predictive value	1.00	0.88	0.95

Table adapted from McVeigh KH, Lurie-Moroni E, Chan PY, et al. Generalizability of indicators from the New York City Macroscope Electronic Health Record Surveillance System to Systems Based on Other EHR Platforms. eGEMS. 2017;5(1):25. DOI:http://doi.org/10.13063/egems.247 CI, confidence interval; EHRs, electronic health records.

*Restricted to EHRs from providers or practices attesting to Stage 1 Meaningful Use as of December 31, 2013.

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SUGGESTED CITATION

NYC Macroscope team. NYC Macroscope electronic health record surveillance indicator fact sheet: Hypertension (diagnosis). New York City Department of Health and Mental Hygiene; 2017.

NYC MACROSCOPE TEAM

Pui Ying Chan, Claudia Chernov, Laura Jacobson, Sungwoo Lim, Elizabeth Lurie-Moroni, Katharine H. McVeigh, Remle Newton-Dame, Sharon E. Perlman, Matthew L. Romo, Lauren Schreibstein, Sarah Shih, Elisabeth Snell, Kathleen Tatem, Lorna E. Thorpe

For more information about this project, please visit

http://www1.nyc.gov/site/doh/data/health-tools/nycmacroscope.page

or email us at

nycmacroscope@health.nyc.gov.