

**Appendix**  
**Human Papillomavirus Vaccine Impact on Cervical Precancers in a Low-Vaccination Population**  
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**Appendix Table 1.** Administrative Billing Codes and Beta Coefficients Used to Determine Prediction Scores<sup>a</sup> for CIN2+ Status

Predictor <sup>b</sup>	Billing codes	$\beta$
1. Constant	–	–5.915605
2. CIN2+ tissue diagnosis	233.1, 622.12, D06.0, D06.1, D06.7, D06.9, N87.2, N87.1	5.341873
3. Non-specific CIN diagnosis	622.10, N87.9	0.3964537
4. High-grade squamous intraepithelial lesion diagnosis	795.04, R87.613	0.9338596
5. CIN1 tissue diagnosis	622.11, N87.1	–0.2115674
6. Low-grade squamous intraepithelial lesion diagnosis	795.03, R87.612	0.3541705
7. Atypical squamous cells of undetermined significance diagnosis	795.01 795.02, R87.610, R87.611	0.2838765
8. Human papillomavirus screening examination <sup>c</sup>	V73.81, Z11.51	–0.0893877
9. Papanicolaou smear/test <sup>c</sup>	V72.31, V72.32, V76.2, V76.47, 795.06, 91.46, Z01.411, Z01.419, Z01.42, Z12.4, Z12.72, R87.614, 88141-88145, 88147-88148, 88150-88158, 88164-88167, 88174-88175, P3000-P3001, G0101, G0123-G0124, G0141, G0143-G0145, G0147-G0148, Q0091	–0.1695168
10. Human papillomavirus DNA test <sup>c</sup>	795.05, 795.09, R87.10, R87.820, 87620-87622, 87623-87625	0.2082338
11. Cervical treatment procedure	57511, 57510, 57513, 57530–57531, 57540, 57545, 57550, 57555, 57556, 57520, 57522	0.9440706
12. Cervical or vaginal biopsy	57421, 57450, 57454, 57455, 57460, 57500, 58110	0.9414902

<sup>a</sup>Prediction scores to determine CIN2+ status were calculated by the following equation:

$$\beta_1 + (\beta_2 * \text{Predictor}_2) + (\beta_3 * \text{Predictor}_3) + (\beta_4 * \text{Predictor}_4) + (\beta_5 * \text{Predictor}_5) + (\beta_6 * \text{Predictor}_6) + (\beta_7 * \text{Predictor}_7) + (\beta_8 * \text{Predictor}_8) + (\beta_9 * \text{Predictor}_9) + (\beta_{10} * \text{Predictor}_{10}) + (\beta_{11} * \text{Predictor}_{11}) + (\beta_{12} * \text{Predictor}_{12}).$$

<sup>b</sup>Predictors were coded as 1 if any of the corresponding billing codes were identified within 60 days from a woman’s cervical diagnostic procedure date; if a woman had a cluster of cervical diagnostic procedures within 30 days of each other, predictor billing codes were searched within –60 days to +60 days from the earliest and latest date, respectively, in the cluster of procedures; predictors were coded as 0 if the search criteria were not met.

<sup>c</sup>Billing codes for a human papillomavirus screening examination, Papanicolaou smear/test, and human papillomavirus DNA test were also used to identify the annual subpopulation of women who were screened for cervical cancer.

CIN, cervical intraepithelial neoplasia.

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**Appendix Table 2.** Annual Age-Group-Specific Cervical Cancer Screening Proportions<sup>a</sup> Among TennCare-Enrolled Women Aged 18–39 Years, 2008–2018

Characteristic	Year											
	Overall	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
	%	%	%	%	%	%	%	%	%	%	%	%
Age group, years												
18–20	27.0	46.0	45.7	44.0	37.3	30.8	26.0	20.8	17.2	15.1	14.4	12.4
21–24	39.8	49.2	50.8	50.4	48.0	45.8	42.3	37.5	33.2	31.0	31.9	30.1
25–29	36.5	43.6	45.1	43.8	42.0	40.7	38.1	35.2	32.0	30.7	31.3	30.5
30–34	31.4	34.6	37.9	37.7	36.3	35.2	33.2	31.0	28.1	27.4	27.1	26.7
35–39	26.9	29.5	31.4	31.7	29.6	29.0	27.9	26.9	25.1	24.1	24.4	23.8
Total	32.6	40.9	42.4	41.8	38.9	36.6	33.9	30.8	27.7	26.4	26.3	25.4

<sup>a</sup>Percentages represent the proportion of women in each age group who were screened annually, calculated by dividing the number of screened women in each age group by the total number of women in each age group, by year.

TennCare, Tennessee Medicaid.