

Cervical Dysplasia Rates Remain Steady Despite Reports of Declines in Cervical Cancer

Diagnoses

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Key Findings:

- Cervical dysplasia is diagnosed at an average rate of 79 patients per 1,000 pap smears performed each month. This rate has generally not changed since 2018 apart from a temporary marked increase at the start of the COVID-19 pandemic, during which time screening volumes were atypically low.

The U.S. Preventative Services Task Force (USPSTF) recommends that women aged 21 to 65 be screened every three to five years for cervical cancer.¹ The Centers for Disease Control and Prevention (CDC) reported that the incidence of cervical cancer diagnoses has declined over the past couple of decades, likely in part due to the introduction of the human papilloma virus (HPV) vaccine.² Cervical dysplasia is the presence of abnormal cells on the cervix, which can become cancerous. However, with early diagnosis and treatment, most cases do not progress to cancer.³ Cervical dysplasia is classified into CIN 1, CIN 2, and CIN 3 based on the thickness of epithelium affected by the abnormal cells, with CIN 3 being the most severe.³

To determine whether cervical dysplasia diagnosis rates have changed over time in a similar pattern to cervical cancer, we evaluated 3,343,330 pap smears and 264,395 cervical dysplasia diagnoses between January 2018 and June 2023. We found that overall, the rate of cervical dysplasia diagnoses has remained consistent over time, with an average of 79 diagnoses for every 1,000 pap smears each month, as seen in Figure 1. This number nearly doubled in April 2020 to 159 diagnoses per 1,000 pap smears, likely reflecting that only patients with the highest risk of cervical cancer were tested at a time of generally reduced screening volume.⁴ The highest incidence of CIN classification in newly diagnosed patients is CIN 1, with an average of 47 diagnoses per 1,000 screenings. The incidences of CIN 2 and CIN 3 were lower, with an average of 6 and 11 diagnoses per 1,000 screenings, respectively.

New Cervical Dysplasia Diagnosis Rates

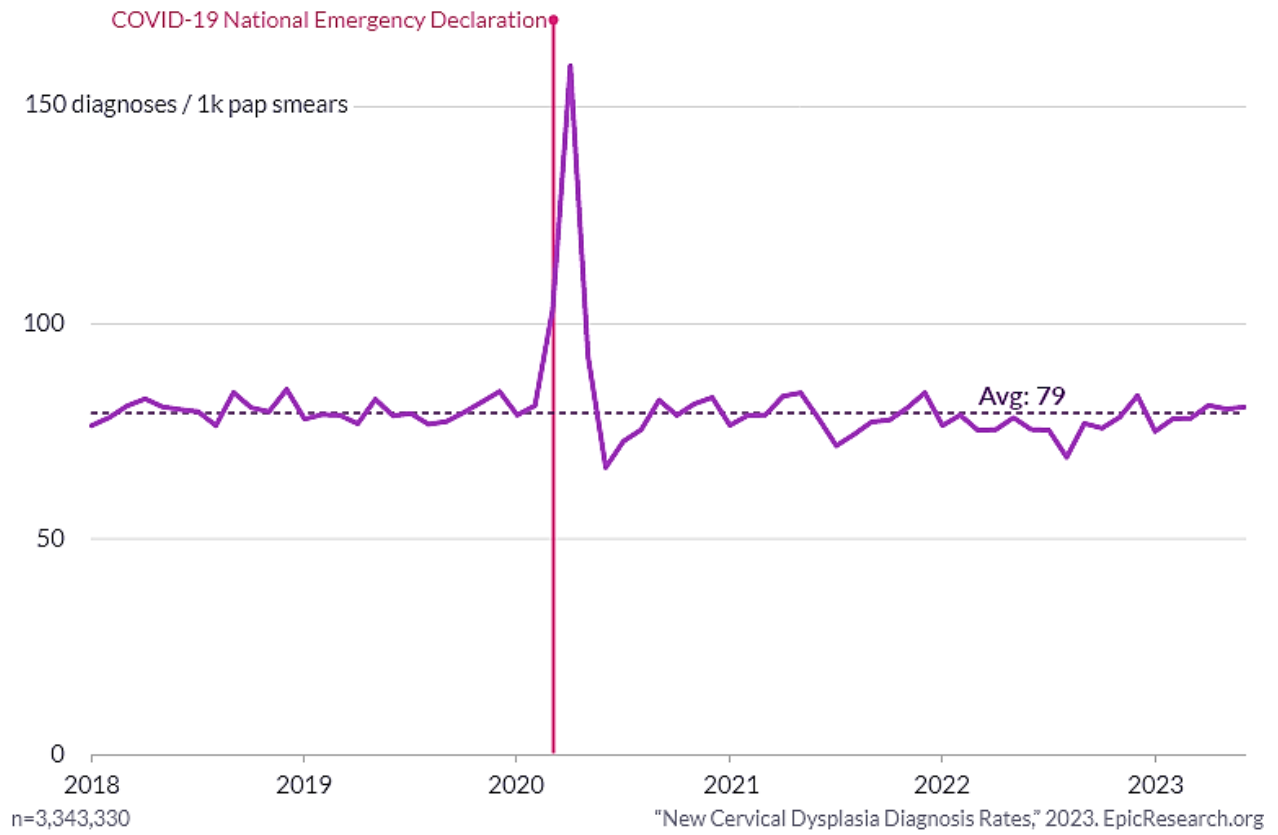


Figure 1a. Monthly rates of new cervical dysplasia diagnoses per 1,000 pap smear procedures.

New Cervical Dysplasia Diagnosis Rates

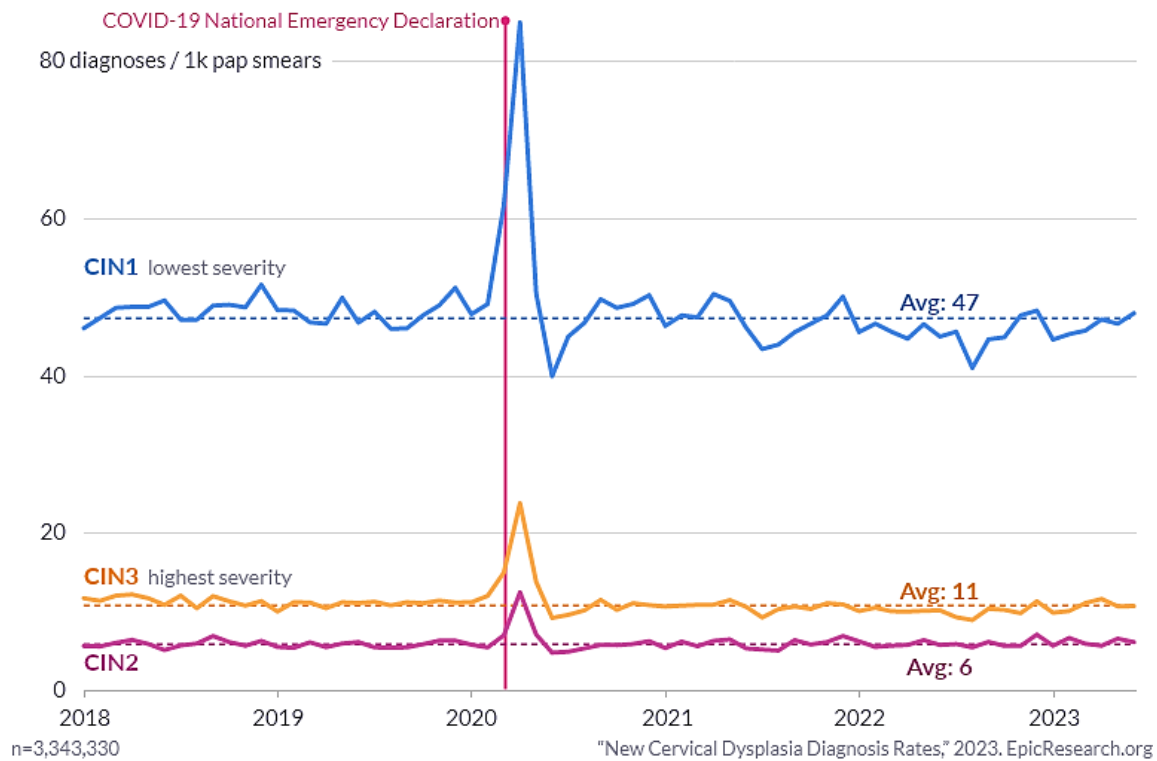


Figure 1b. Monthly rates of new cervical dysplasia diagnoses per 1,000 pap smear procedures by CIN classification.

Stratifications by patient age, race and ethnicity, and social vulnerability index followed the same pattern as the overall rate, remaining steady throughout the study period apart from April 2020.

These data come from Cosmos, a HIPAA-defined Limited Data Set of more than 220 million patients from 221 Epic organizations including 1,260 hospitals and more than 27,100 clinics, serving patients in all 50 states and Lebanon. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. Graphics by Brian Olson.

References

1. *Cervical cancer: Screening.* (2018, August 21). Uspreventiveservicestaskforce.org; US Preventive Services Taskforce. <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/cervical-cancer-screening>
2. *Cervical cancer rates have dropped among young women in the United States.* (2023, May 24). Cdc.gov. <https://www.cdc.gov/cancer/dcpc/research/articles/cervical-cancer-rates-young-women.htm>
3. *Cervical dysplasia.* (2022, January 31). Cleveland Clinic. <https://my.clevelandclinic.org/health/diseases/15678-cervical-intraepithelial-neoplasia-cin>
4. Alban, C., Sahakian, S., Allen, S., & Stamp, T. (2023, February 17). *Missed Cancer Screenings Not Yet Associated with Increased Cancer Rates or Severity.* Epic Research. <https://www.epicresearch.org/articles/missed-cancer-screenings-not-associated-with-increased-cancer-rates-or-severity>

Data Definitions

Term	Definition
Study period	1/1/2018-6/30/2023
Study population	Female patients aged 21-65 with no prior history of cervical cancer diagnosis or cervical dysplasia diagnosis . To be included, patients must have more than one encounter at least one year ago and one in the past year.
Cervical dysplasia diagnosis	A patient's first diagnosis of CIN 1 , CIN 2 , CIN 3 , or CIN unspecified .
CIN 1	A diagnosis with ICD-10-CM code N87.0, N87.9, or R87.612.
CIN 2	A diagnosis with ICD-10-CM code N87.1.
CIN 3	A diagnosis with ICD-10-CM code D06* or R87.613.
CIN unspecified	A diagnosis with ICD-10-CM code N87.9.
Cervical cancer diagnosis	A diagnosis with SNOMED concept grouper #363354003 or #372024009.
Screenings (pap smear)	A procedure with one of the following CPT codes: <ul style="list-style-type: none"> • 88141-88143 • 88147 • 88148 • 88150 • 88152-88154 • 88164-88167 • 88174 • 88175

Table 1: New Cervical Dysplasia Diagnosis Rates

Month Start Date	Pre Cancers	Paps	Pre Cancer Per 1k Pap	CIN 1	CIN 1 Per 1k Pap	CIN 2	CIN 2 Per 1k Pap	CIN 3	CIN 3 Per 1k Pap
2018-01-01	3,825	50,037	76.4	2,306	46.1	288	5.8	589	11.8
2018-02-01	3,582	45,749	78.3	2,168	47.4	260	5.7	523	11.4
2018-03-01	3,939	48,661	80.9	2,370	48.7	299	6.1	588	12.1
2018-04-01	3,964	47,983	82.6	2,343	48.8	312	6.5	587	12.2
2018-05-01	4,049	50,176	80.7	2,449	48.8	300	6.0	591	11.8
2018-06-01	3,673	45,847	80.1	2,276	49.6	240	5.2	501	10.9
2018-07-01	3,601	45,214	79.6	2,133	47.2	263	5.8	547	12.1
2018-08-01	3,889	50,898	76.4	2,402	47.2	308	6.1	534	10.5
2018-09-01	3,622	43,117	84.0	2,112	49.0	301	7.0	519	12.0
2018-10-01	4,288	53,250	80.5	2,614	49.1	332	6.2	605	11.4
2018-11-01	3,722	46,748	79.6	2,279	48.8	270	5.8	506	10.8
2018-12-01	3,549	41,882	84.7	2,162	51.6	268	6.4	478	11.4
2019-01-01	4,083	52,407	77.9	2,536	48.4	295	5.6	528	10.1
2019-02-01	3,835	48,559	79.0	2,348	48.4	267	5.5	546	11.2
2019-03-01	3,915	49,690	78.8	2,328	46.9	309	6.2	558	11.2

2019-04-01	4,214	54,858	76.8	2,560	46.7	308	5.6	575	10.5
2019-05-01	4,301	52,145	82.5	2,605	50.0	316	6.1	586	11.2
2019-06-01	3,730	47,421	78.7	2,221	46.8	296	6.2	529	11.2
2019-07-01	4,027	50,840	79.2	2,450	48.2	283	5.6	575	11.3
2019-08-01	4,011	52,292	76.7	2,407	46.0	290	5.5	568	10.9
2019-09-01	3,824	49,466	77.3	2,279	46.1	275	5.6	556	11.2
2019-10-01	4,503	56,702	79.4	2,706	47.7	338	6.0	631	11.1
2019-11-01	3,887	47,500	81.8	2,327	49.0	305	6.4	545	11.5
2019-12-01	3,816	45,269	84.3	2,320	51.2	290	6.4	508	11.2
2020-01-01	4,382	55,587	78.8	2,661	47.9	328	5.9	626	11.3
2020-02-01	4,139	51,098	81.0	2,513	49.2	284	5.6	616	12.1
2020-03-01	3,410	33,055	103.2	2,041	61.7	234	7.1	497	15.0
2020-04-01	1,536	9,632	159.5	819	85.0	120	12.5	230	23.9
2020-05-01	2,408	26,090	92.3	1,318	50.5	187	7.2	361	13.8
2020-06-01	3,456	51,799	66.7	2,071	40.0	254	4.9	480	9.3
2020-07-01	3,827	52,586	72.8	2,368	45.0	265	5.0	507	9.6
2020-08-01	3,887	51,531	75.4	2,411	46.8	281	5.5	527	10.2
2020-09-01	4,348	52,858	82.3	2,631	49.8	311	5.9	610	11.5
2020-10-01	4,392	55,764	78.8	2,715	48.7	326	5.8	574	10.3
2020-11-01	3,913	48,041	81.5	2,362	49.2	288	6.0	534	11.1
2020-12-01	4,143	49,993	82.9	2,515	50.3	318	6.4	545	10.9
2021-01-01	4,243	55,491	76.5	2,574	46.4	304	5.5	594	10.7
2021-02-01	4,149	52,700	78.7	2,516	47.7	331	6.3	570	10.8
2021-03-01	5,012	63,592	78.8	3,020	47.5	363	5.7	694	10.9
2021-04-01	4,708	56,581	83.2	2,854	50.4	361	6.4	619	10.9
2021-05-01	4,216	50,222	83.9	2,490	49.6	330	6.6	578	11.5
2021-06-01	4,203	53,807	78.1	2,486	46.2	293	5.4	574	10.7
2021-07-01	3,610	50,307	71.8	2,185	43.4	267	5.3	469	9.3
2021-08-01	4,012	53,940	74.4	2,374	44.0	280	5.2	560	10.4
2021-09-01	4,048	52,378	77.3	2,388	45.6	339	6.5	561	10.7
2021-10-01	4,023	51,787	77.7	2,417	46.7	307	5.9	539	10.4
2021-11-01	4,044	50,271	80.4	2,400	47.7	314	6.2	559	11.1
2021-12-01	3,915	46,637	83.9	2,337	50.1	326	7.0	512	11.0
2022-01-01	3,813	49,906	76.4	2,276	45.6	315	6.3	506	10.1
2022-02-01	3,900	49,461	78.9	2,309	46.7	278	5.6	522	10.6
2022-03-01	4,497	59,694	75.3	2,724	45.6	345	5.8	603	10.1
2022-04-01	4,212	55,816	75.5	2,498	44.8	328	5.9	562	10.1
2022-05-01	4,294	54,872	78.3	2,557	46.6	356	6.5	557	10.2
2022-06-01	4,213	55,776	75.5	2,512	45.0	327	5.9	571	10.2
2022-07-01	3,692	48,992	75.4	2,236	45.6	294	6.0	458	9.3
2022-08-01	4,208	60,907	69.1	2,501	41.1	340	5.6	548	9.0

2022-09-01	4,320	56,163	76.9	2,510	44.7	352	6.3	586	10.4
2022-10-01	4,305	56,802	75.8	2,553	44.9	327	5.8	585	10.3
2022-11-01	4,249	54,211	78.4	2,588	47.7	311	5.7	534	9.9
2022-12-01	4,079	48,951	83.3	2,366	48.3	351	7.2	556	11.4
2023-01-01	4,372	58,242	75.1	2,601	44.7	337	5.8	577	9.9
2023-02-01	4,270	54,747	78.0	2,482	45.3	370	6.8	555	10.1
2023-03-01	4,744	60,739	78.1	2,781	45.8	365	6.0	678	11.2
2023-04-01	4,322	53,295	81.1	2,516	47.2	308	5.8	622	11.7
2023-05-01	4,652	58,007	80.2	2,707	46.7	387	6.7	623	10.7
2023-06-01	4,380	54,291	80.7	2,606	48.0	338	6.2	584	10.8