# 1,905 Children Aged 0–14 Were Diagnosed with Cancer in 2023; Leukemia, Brain and Central Nervous System, and Malignant Lymphoma Make Up 0.5848, and "Other," Outside the 21 Sites Listed for Cancers Common in Adults, Is 0.3333 at Ages 0–4 — the Share of Deaths at Ages 5–9 That Are from Cancer, 23.2%, Is Almost the Same as at All Ages (23.9%), but the Cancer Death Rate Is 1.8 per 100,000, 1/177.4 of the All-Age 319.3 [M098]

**Reading children's cancer in the same tables as adults' = the part that falls outside the site list + the difference between a share and a rate ── What separates them is whether the number is "a share within that age" or "a rate per population"**

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## Abstract

**Using the 2023 National Cancer Registry's incidence counts and rates by age group (by site) and the 2024 Vital Statistics' deaths, death rates, and shares by age from the table of leading causes of death, this paper looked at how to read the numbers for children's (ages 0–14) cancer in the same tables as adults' cancer. No new mathematical theorem and no new law are claimed. The numbers here summarize the national population; they are not numbers for any one person's outlook.**

First, **1,905 children aged 0–14 were diagnosed with cancer in 2023, 0.0019 of the 993,469 at all ages. By age group, the incidence rate at ages 5–9, 9.86 per 100,000, is the lowest of all age groups; ages 0–4 are 19.23 (1.951 times ages 5–9) and ages 10–14 are 12.24** (Section 4).

Second, this is the core of the paper. **At ages 0–14, three sites — leukemia 699 (0.3669), brain and central nervous system 283 (0.1486), and malignant lymphoma 132 (0.0693) — make up 0.5848. At**

**all ages these three are only 0.0589, while five sites — colorectum, lung, stomach, breast, and prostate — make up 0.5923. Those five together are 24 children (0.0126) at ages 0–14** (Section 5).

Third, **"other," outside the 21 sites that the National Cancer Registry tables list by name, is 0.3333 at ages 0–4, 0.1635 at ages 5–9, and 0.2523 at ages 10–14, more than 4 times the 0.0339–0.0698 at every age group from 40 up.** The ICD-10 ranges of the 21 sites do not include the codes for bone, soft tissue, eye, adrenal gland, and others (C40, C41, C47, C49, C69, C74). In a classification that lists cancers common in adults, a sizable part of children's cancer falls into a row without a name (Section 5).

Fourth, **the share of deaths at ages 5–9 that are from cancer is 23.2%, almost the same as the all-age 23.9%, but the cancer death rate is 1.8 per 100,000, 1/177.4 of the all-age 319.3. The rates differ this much despite similar shares because deaths themselves are few at this age: a rough all-cause death rate (cancer rate ÷ share) is about 7.8 at ages 5–9 against 1336.0 at all ages** (Section 6).

Fifth, the age with the lowest cancer death rate is 1–4 (1.5), followed by 5–9 (1.8). Ages 10–14 have a share of 18.5% and a rate of 1.9 (Section 6).

Sixth, what separates them is **whether the number is "a share within that age" or "a rate per population."** "Cancer is a large cause of children's deaths" is a statement about shares and is different from "children's cancer is common." On a site list built for adults' cancer, children's cancer falls largely into a row without a name.

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**Scope note**: **This paper claims no new mathematical theorem and no new law** — incidence counts, incidence rates, deaths, death rates, and shares are in public tables, and this paper only lined them up by age and site, computed "other," and compared shares with rates. **This paper is a structural interpretation of the shape of numbers in public aggregate data; it is not medical advice, not a diagnosis, and not a treatment recommendation. The author is not a physician. Decisions about individual health should be discussed with a physician or a medical institution. This is a preprint that has not been peer reviewed. Mindful that children with cancer and their families may read it, this paper states first that its numbers summarize the national population and are not any one child's outlook. It does not touch treatment, screening, survival, or hospitals, and does not discuss why cancer occurs.** Sites with fewer than 10 children at ages 0–14 combined are given only as a total, and figures by age group are shown only for sites with 10 or more in each of the 3 age groups. What "other" consists of cannot be known from these tables. The National Cancer Registry does not tabulate by the International Classification of Childhood Cancer (ICCC); the sites here are the same ICD-10 sites as for adults. Incidence is 2023 and deaths are 2024, different years. Rankings of causes of death are not discussed. **About the data**: the National Cancer Registry and the Vital Statistics (Ministry of Health, Labour and Welfare) were taken from e-Stat and used under the Government of Japan Standard Terms of Use (Version 2.0); "other," shares, age-combined counts, and the rough all-cause death rate in this paper were processed from them. What this paper adds: **showing, by separating shares from rates, that reading children's cancer in the same site table as adults puts more than 4 times adults' share into "other," and that the share of deaths from cancer at ages 5–9 is almost the same as at all ages while the rate is 1/177.4**.

## 1. Introduction, notation and question

The numbers here summarize all children in the country. They do not represent any one child's outlook or the result of treatment.

- **Incidence count and rate**: the number of people diagnosed with cancer that year, and the number per 100,000 population.
- **21 sites**: the non-overlapping sites listed by name in the National Cancer Registry tables (colon and rectum are subdivisions of colorectum, and cervix and corpus uteri of uterus, so they are excluded).
- **Other**: incidence for all sites − sum of the 21 sites.
- **Share of deaths**: the share (%) of cancer deaths when deaths at that age are 100. **Death rate**: deaths per 100,000 population.

**Question**: When children's cancer is read in the same tables as adults', what becomes hard to see, and what is easy to mistake?

**Observation 1.1**: M029 looked at how fast incidence doubles with age at 40–84, and M031 looked at how the "most common cancer" changes with how sites are grouped. This paper looks at the children's side of those tables.

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## 2. Preview and design

**Written honestly**: the design was decided after looking at the tables.

| | Content |
|---|---|
| Tables | National Cancer Registry 2023, Table 2-A (incidence by age group, by site and sex) and Table 3-1-A (incidence rate by age group); Vital Statistics 2024, Volume 1, Table 5.17 (deaths, death rates, and shares by sex and age, by leading cause) |
| Noticed in the preview | At ages 0–14, leukemia, brain and central nervous system, and malignant lymphoma were common, and sites common in adults were almost 0. What remained after subtracting the 21 sites from all sites was large at ages 0–4 |
| Noticed in the preview (2) | Site × age group has many cells under 10. Those under 10 are combined rather than shown one by one |
| Noticed in the preview (3) | In the table of leading causes of death, cancer's share was large at children's ages while the rate was very small |
| Comparison | Incidence rate by age group, site composition at ages 0–14, share of "other" by age, and share of deaths and death rate |

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## 3. Data and checks

**Calculation 3.1** The 3 retrieved files were fixed by SHA-256, and the following were checked.

- Tables 2-A and 3-1-A have the same age groups in the same order: 21 groups from 0–4 to 100 and over, plus not stated.
- In Table 2-A, male + female differs from the total at 14 cells, all in the total column or the 45–49, 55–59, and 60–64 columns, with the total larger by 1–4. All columns for ages 0–14 match. I first set that everything matches and it failed, then miscounted it as all sites only and it failed twice. This paper uses the total.
- Colon + rectum = colorectum was confirmed, and the non-overlapping sites were set at 21. The ICD-10 ranges of the 21 sites cover 58 of the codes C00–C96.
- From the both-sexes block of Table 5.17, deaths, death rates, and shares for malignant neoplasms were read for each age from 0 to 100 and over. At age 0, malignant neoplasms are not in the top 10.

## 4. Incidence rate by age group

**Calculation 4.1** Cancer incidence (2023, all sites, both sexes)

| Age group | Cases | Rate (per 100,000) |
|---|---|---|
| 0–4 | 786 | 19.23 |
| 5–9 | 477 | 9.86 |
| 10–14 | 642 | 12.24 |
| 15–19 | 907 | 16.51 |
| 40–44 | 17,105 | 220.28 |
| 60–64 | 72,002 | 959.00 |
| 85–89 | 99,371 | 2497.39 |

**Observation 4.2**: **The incidence rate at ages 5–9, 9.86, is the lowest of all age groups. Ages 0–4 are 19.23, 1.951 times ages 5–9, and ages 10–14 are 12.24, 1.242 times. The highest, ages 85–89 at 2497.39, is 253.4 times ages 5–9.** The 1,905 cases at ages 0–14 are 0.0019 of the 993,469 at all ages.

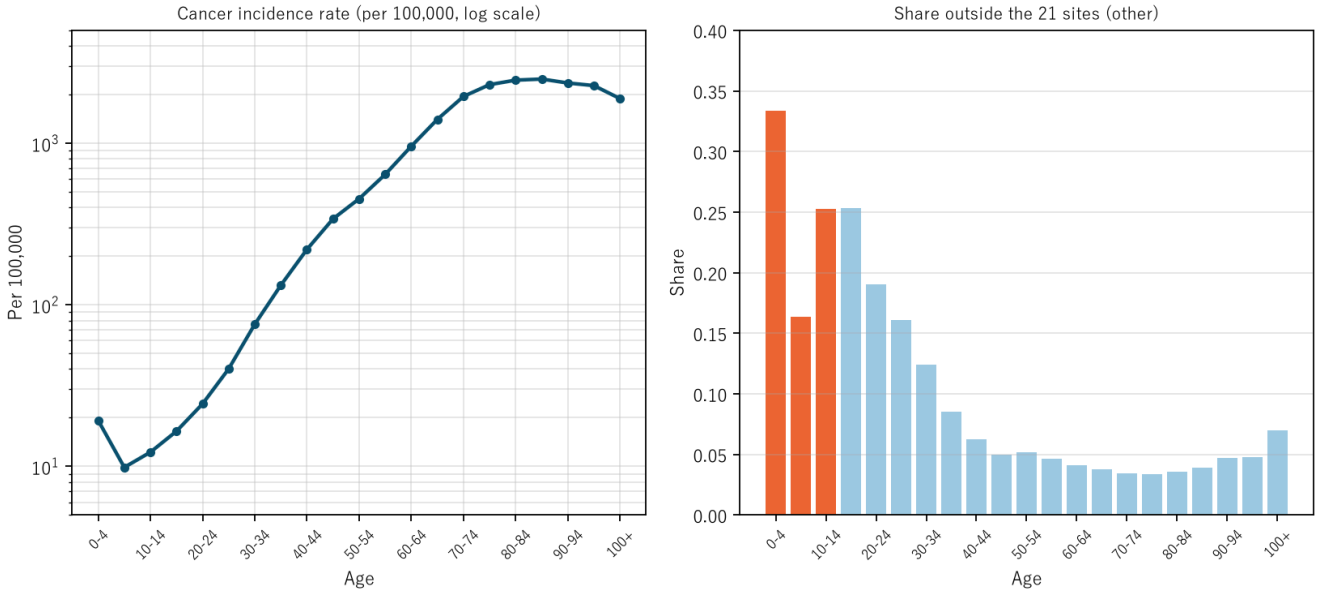


**Figure 1**: Left, cancer incidence rate by age group (per 100,000, log scale). Right, the share outside the 21 sites (other); orange is ages 0–14.

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## 5. The core — site composition and "other"

**Calculation 5.1** Sites at ages 0–14 (2023, both sexes, sites with 10 or more)

| Site | Ages 0–14 | Share at 0–14 | Share at all ages |
|---|---|---|---|
| Leukemia | 699 | 0.3669 | 0.0153 |
| Brain and central nervous system | 283 | 0.1486 | 0.0058 |
| Malignant lymphoma | 132 | 0.0693 | 0.0378 |
| Ovary | 64 | 0.0336 | 0.0130 |
| Kidney and urinary tract (excl. bladder) | 57 | 0.0299 | 0.0310 |
| Liver and intrahepatic bile ducts | 50 | 0.0262 | 0.0329 |
| Thyroid | 35 | 0.0184 | 0.0166 |
| Pancreas | 25 | 0.0131 | 0.0479 |
| Skin | 13 | 0.0068 | 0.0275 |
| Oral cavity and pharynx | 12 | 0.0063 | 0.0239 |
| Colorectum | 11 | 0.0058 | 0.1551 |

The 10 sites with fewer than 10 at ages 0–14 total 22 (0.0115).

**Calculation 5.2** Main sites and "other" by age group (cases)

| Age group | Leukemia | Brain and CNS | Malignant lymphoma | Other | Share of other |
|---|---|---|---|---|---|
| 0–4 | 310 | 85 | 29 | 262 | 0.3333 |
| 5–9 | 204 | 101 | 43 | 78 | 0.1635 |
| 10–14 | 185 | 97 | 60 | 162 | 0.2523 |

**Observation 5.3**: **At ages 0–14, leukemia, brain and central nervous system, and malignant lymphoma make up 1,114 (0.5848). At all ages these three are only 0.0589. The share of leukemia, 0.3669, is 24.0 times its all-age 0.0153, and brain and central nervous system is 25.5 times. The five sites common at all ages — colorectum, lung, stomach, breast, and prostate — make up 0.5923 at all ages but only 24 children (0.0126) at ages 0–14.**

**Observation 5.4**: **Outside the 21 sites (other), there are 262 at ages 0–4 (0.3333), 78 at ages 5–9 (0.1635), and 162 at ages 10–14 (0.2523), 502 (0.2635) at ages 0–14 combined. At each age group from 40 up it is 0.0339–0.0698, and the share at ages 0–4 is more than 4 times the largest of these.** The ICD-10 ranges of the 21 sites do not include the codes for bone (C40, C41), peripheral nerves (C47), soft tissue (C49), eye (C69), or adrenal gland (C74). Which diseases "other" consists of cannot be known from these tables.

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## 6. Share of deaths and death rate

**Calculation 6.1** Deaths from malignant neoplasms (2024, both sexes)

| Age | Deaths | Share of deaths (%) | Death rate (per 100,000) | Rough all-cause rate |
|---|---|---|---|---|
| 1–4 | 47 | 9.1 | 1.5 | 16.5 |
| 5–9 | 81 | 23.2 | 1.8 | 7.8 |
| 10–14 | 95 | 18.5 | 1.9 | 10.3 |
| 15–19 | 120 | 9.3 | 2.3 | 24.7 |
| 35–39 | 902 | 21.3 | 13.8 | 64.8 |
| 60–64 | 17,064 | 40.7 | 228.8 | 562.2 |
| All ages | 384,111 | 23.9 | 319.3 | 1336.0 |

Rough all-cause rate = cancer death rate ÷ share. The table values are rounded to 0.1, so the rough rate at ages 5–9 lies between 7.53 and 7.99.

**Observation 6.2**: **The share of deaths at ages 5–9 that are from cancer, 23.2%, differs from the all-age 23.9% by less than 1 point. Even so, the cancer death rate is 1.8, 1/177.4 of the all-age 319.3. The rates differ this much despite similar shares because the rough all-cause rate differs 172.2-fold, about 7.8 at ages 5–9 against 1336.0 at all ages.** Only ages 35–39 (21.3%) have a share within 2 points of ages 5–9, and their rate is 13.8. The age with the lowest cancer death rate is 1–4 (1.5), followed by 5–9 (1.8).

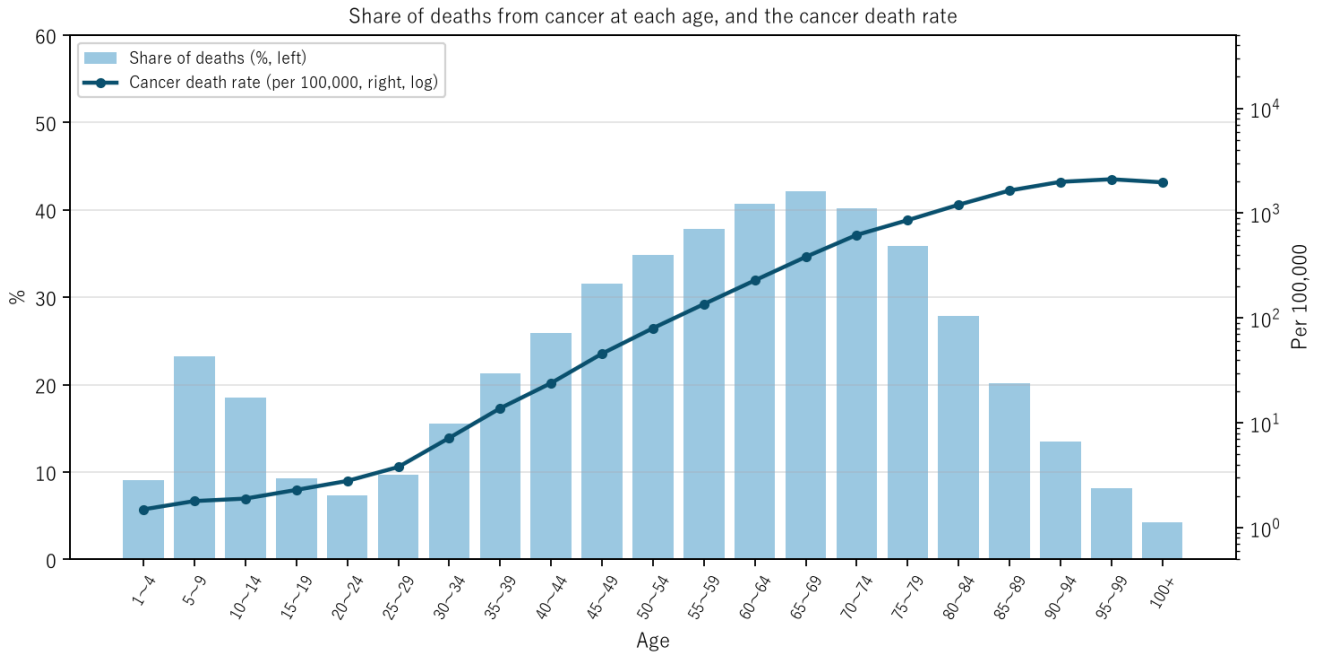


**Figure 2**: Bars are the share of deaths at each age that are from cancer (%, left axis); the line is the cancer death rate (per 100,000, right axis, log scale).

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## 7. Limitations

1. **The numbers in this paper summarize the national population and are not any one person's outlook.** Treatment, screening, survival, and hospitals are not touched, and why cancer occurs is not discussed.
2. Sites are the same ICD-10 sites as for adults, not the International Classification of Childhood Cancer (ICCC). What "other" consists of is not known.
3. Sites with fewer than 10 at ages 0–14 are given only as a total. Sex is not separated.
4. Incidence is 2023 and deaths are 2024, different years. The rough all-cause rate is derived from rounded table values and has a range.
5. Rankings of causes of death are not discussed.

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## Conclusion

1,905 children aged 0–14 were diagnosed with cancer in 2023; leukemia, brain and central nervous system, and malignant lymphoma made up 0.5848, and "other," outside the 21 sites listed for cancers common in adults, was 0.3333 at ages 0–4. The share of deaths at ages 5–9 that are from cancer is almost the same as at all ages, but the cancer death rate is 1/177.4 of the all-age rate.

**What separates them is one thing — whether the number is "a share within that age" or "a rate per population."**

When looking at numbers for children's cancer, **check together whether it is a share or a rate, and which row of a site list built for adults the number sits in.**

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## Data and reproduction

| | |
|---|---|
| Data | National Cancer Registry 2023, Tables 2-A and 3-1-A; Vital Statistics 2024, Volume 1, Table 5.17 (Ministry of Health, Labour and Welfare, e-Stat) (retrieved 26 September 2026) |
| Terms of use | e-Stat follows the Government of Japan Standard Terms of Use (Version 2.0). "Other," shares, age-combined counts, and the rough all-cause death rate in this paper were processed from it and are not numbers produced by the government |
| Coverage | Japan, both sexes, incidence 2023, deaths 2024, ages 0–14 and all ages |
| Verification | `検算/M098.py` (`--zu` also draws the figures). Every number in the text is taken from `検算/M098_output.txt` |
| Raw data | `data/` holds the retrieved files and `SOURCES.md` (URLs, retrieval date, SHA-256, terms of use, definitions and how the calculations were set up) |
| Figures | `図/M098_zu1`, `図/M098_zu2` (png, svg, English versions) |

## References


- Ministry of Health, Labour and Welfare. National Cancer Registry, incidence counts and rates 2023, national, Tables 2-A and 3-1-A (in Japanese). e-Stat (accessed 26 September 2026). https://www.e-stat.go.jp/
- Ministry of Health, Labour and Welfare. Vital Statistics 2024, final figures, Volume 1, deaths, Table 5.17 (in Japanese). e-Stat (accessed 26 September 2026). https://www.e-stat.go.jp/
- Yamagishi, Y. (2026). Women's Cancer Incidence Takes Longer to Double with Age (17.7 Years) Than Men's (7.5 Years) Because Breast, Uterus, Ovary, and Thyroid Do Not Double with Age — Without Those Four It Is 9.7 Years [M029]. Zenodo. https://doi.org/10.5281/zenodo.22968904
- Yamagishi, Y. (2026). Which Cancer Is "Most Common" Changes with How Sites Are Grouped — For Both Sexes, the Top Site by Cases Is Colorectum When Grouped, Lung When Colon and Rectum Are Split, and Prostate at ICD Four Characters [M031]. Zenodo. https://doi.org/10.5281/zenodo.22972431