HEALTH AND HAZARDOUS SUBSTANCES
REGISTRY
NEWSLETTER
ILLINOIS DEPARTMENT OF PUBLIC HEALTH

Fall 2001

Decline in Cases of Infants Born with a Positive Toxicity for Controlled Substances in Illinois

The number of newborn infants who were reported to the Adverse Pregnancy Outcomes Reporting System (APORS) as having positive test results for a controlled substance declined by 50 percent between 1994 and 1999. The rate of substance exposure was 145.9 infants per 10,000 live births in 1994 and was 72.5 per 10,000 live births in 1999. The change is consistent with national trends during the same time period.

Under the APORS regulations (Illinois Health and Hazardous Substances Registry, 77 ILL. Adm. Code 840), Illinois hospitals are required to report newborns who have a positive urine toxicity for a controlled substance, or who have a diagnosis of drug withdrawal or drug toxicity. Hospitals indicate whether an infant is positive for an opioid, a barbiturate, cocaine, cannabis, other controlled substances or a combination of drugs. Since 1991, the APORS program has been tracking the number of cases and the types of drugs found. The following tables shows the number of cases and rates for all controlled substances and the drug types.

Table 1. Number of Illinois Infants Reported to APORS with a Positive Toxicity or Diagnosis for a Controlled Substance, 1991-1999

Year	Opioid	Barbiturate	Cocaine	Cannabis	Other Drugs	Multiple Drugs	Not Stated	Total
1991	160	34	1,504	64	81	276	42	2,161
1992	159	18	1,802	79	48	230	28	2,364
1993	167	29	1,973	95	75	361	15	2,715
1994	165	36	1,871	123	100	439	27	2,761
1995	178	25	1,518	103	102	350	28	2,304
1996	153	31	1,332	122	81	355	21	2,095
1997	154	42	1,049	131	63	283	25	1,747
1998	140	22	916	133	62	307	33	1,613
1999	93	17	759	114	76	219	41	1,319

Table 2. Rates (per 10,000 live births) of Positive Toxicity or Diagnosis for a Controlled Substance among Illinois Newborns, 1991-1999

Year	Opioid	Barbiturate	Cocaine	Cannabis	Other Drugs	Multiple Drugs	Not Stated	Total
1991	8.2	1.8	77.5	3.3	4.2	14.2	2.2	111.4
1992	8.3	0.9	94.4	4.1	2.5	12.0	0.1	123.8
1993	8.8	1.5	103.5	5.0	3.9	18.9	1.5	142.4
1994	8.7	1.9	98.9	6.5	5.3	23.2	0.8	145.9
1995	9.6	1.3	81.7	5.5	5.5	18.8	1.5	124.0
1996	8.4	1.7	72.8	6.7	4.4	19.4	1.5	114.4
1997	8.5	2.3	58.1	7.3	3.5	15.7	1.2	96.7
1998	7.7	1.2	50.2	7.3	3.4	16.8	1.8	88.4
1999	5.1	0.9	41.7	6.3	4.2	12.0	2.3	72.5

Joint-point analyses revealed that changes in toxicity rate during 1991-1999 were characterized by two distinct segments: an increase from 1991 to 1994 of 9.3 percent per year and a decrease from 1994 to 1999 of about 13 percent per year. Both changes were statistically significant and reflect not only changes in controlled substance use by pregnant women, but hospital reporting and testing practices as well.

Exposure to cocaine accounts for most of the fluctuation in the number and rates of drug toxicity cases. In 1993, the cocaine incidence rate was its highest at 103.5 per 10,000 live births; it declined to 41.7 in 1999. Some of the decline in rates may be attributable to decreased testing by hospitals for, although reporting is mandatory, testing is not. Cannabis (marijuana) is the only drug category that has increased. The cannabis rate nearly doubled from 3.3 per 10,000 live births in 1991 to 6.3 per 10,000 in 1999.

A decline in the number of substance-exposed newborns has also been noted by the Illinois Department of Children and Family Services' (DCFS) Division of Quality Assurance as published in its March 2001 report, *Child Abuse Neglect Statistics*. All infants who are exposed to a controlled substance (excluding cannabis) must be reported to DCFS and are subsequently investigated. The number of substance-exposed infants reported to DCFS declined by 57 percent between June 1, 1994, and June 30, 2000.

Changes in Age-adjusted Cancer Incidence Rates Associated with Age-adjustment Using the 2000 U.S. Population Standard

In 1998, all federal agencies were directed by the secretary of the U.S. Department of Health and Human Services to use the year 2000 standard population for age-adjusted rate calculations beginning with 1999 health events. The directive resolves long-standing problems associated with the fact that age-adjusted rates for health-related outcomes have been calculated using different population standards, making data comparisons often impossible.

To date, the Illinois State Cancer Registry (ISCR) has used the 1970 U.S. standard population to calculate age-adjusted rates. ISCR has employed this standard population because the National Cancer Institute has used the 1970 U.S. standard population to age-adjust cancer rates for the last 30 years. Moreover, the Surveillance, Epidemiology and End Results Program (SEER), the North American Association of Central Cancer Registries (NAACCR) and other state population-based central cancer registries have used the same approach. With 1999 cancer data, all of these organizations, including ISCR, will be age-adjusting their cancer rates using the 2000 U.S. standard population.

Difference between the 1970 and 2000 Standard Populations

Figure 1 shows graphically the change that has occurred in the U.S. population structure from 1970 to 2000. As shown, the population presence of the six youngest five-year age groups decreased from 1970 to 2000. The increased population percentages from 1970 to 2000 for the next five age groups (including ages 35 through 54) clearly reflect the aging of the post-World War II baby boomers. Minimal change is observed for ages 55 through 69, which includes those born during the Great Depression and World War II eras. The increase in the oldest four age groups (70 years and older) reflects several factors: the increased life span for persons in the United States as well as the effect of the large cohort of immigrants coming into the U.S. during the early 1900s. Overall, the 1970 - 2000 adjustments reflect an older population standard that more closely resembles the age structure of the current population.

Changes in Cancer Rates with Age-adjustment to the New 2000 Population Standard

Figure 2 displays statistics and rate calculations for invasive cancer incidence from all sites combined occurring among Illinois residents during 1998. The two age-adjusted rates, using the 1970 and 2000 standard populations, differ considerably because the age structure of the 1970 and 2000 standard populations are substantially different. The age-adjusted rate using the year 2000 standard population is about 20 percent higher than the one calculated based on the 1970 standard population. This would be expected given that cancer incidence increases with age and there are larger populations in the older age groups for 2000 when compared with 1970. Indeed, the total adjusted number of cases for 2000 exceeds those for 1970 as shown in columns E and G, even though the actual number of cases, 55,166, is the same for both calculations. Moreover, the differences in the adjusted numbers of cases within an age group category reflects the information in Figure 1. That is, those age groups with population increases from 1970 to 2000 have greater adjusted numbers for 2000 than 1970 and vice versa. It also should be noted that the year 2000 age-adjusted rate is closer to the crude rate because that standard population is very close in age structure to the current population.

The new calculations using year 2000 for the standard population will consistently produce higher cancer rates than those reported using the 1970 standard population. A comparison of these rates for the major cancer control sites by race/ethnicity is shown in Table 1. As shown, every age-adjusted rate is higher for every race/ethnic group using the year 2000 standard population compared with using the 1970 standard population.

Figure 1.
Change in Population by Age Group
Between Standard Populations 1970 and 2000

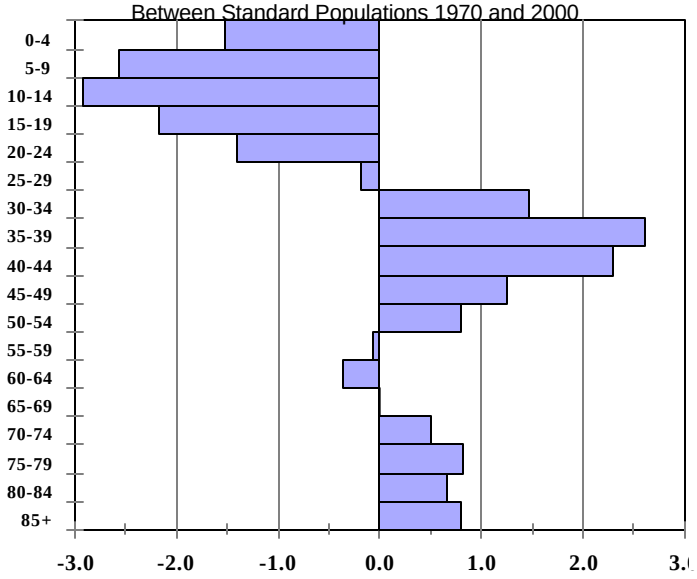
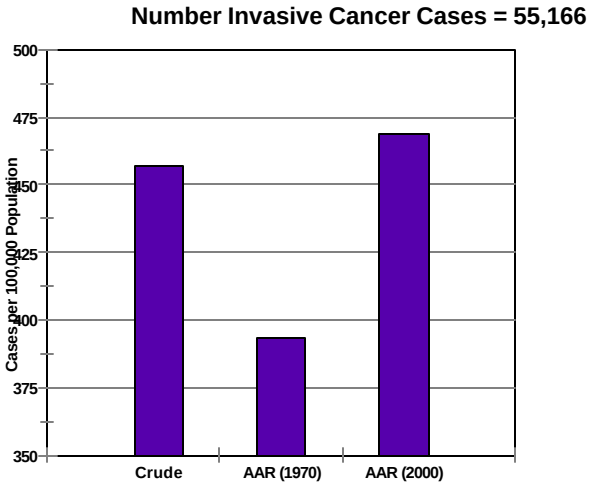


Figure 2.
Comparison of Crude and Age-adjusted Rates (AAR) Using
1970 and 2000 Standard Populations for All Invasive Cancer Incidence



Calculation of Rates: Crude and Age-adjusted by the Direct Method Using Two Standard Populations							
				Age Adjustment with 1970		Age Adjustment with 2000	
	Actual 1998 Cases	1998 Illinois Population	Age-specific Rate	1970 Standard Population	Adjusted 1998 Cases	2000 Standard Population	Adjusted 1998 Cases
Age Group	A	B	C (A ÷ B) x 100,000	D	E (C x D) ÷ 100,000	F	G (C x F) ÷ 100,000
0-4	165	888,229	18.6	84,416	16	69,136	13
5-9	83	911,701	9.1	98,204	9	72,533	7
10-14	104	855,833	12.2	102,304	12	73,032	9
15-19	161	869,276	18.5	93,845	17	72,169	13
20-24	255	780,469	32.7	80,561	26	66,477	22
25-29	430	828,165	51.9	66,320	34	64,529	34
30-34	668	915,459	73.0	56,249	41	71,044	52
35-39	1,231	1,018,801	120.8	54,656	66	80,762	98
40-44	1,956	974,053	200.8	58,958	118	81,851	164
45-49	2,765	833,138	331.9	59,622	198	72,118	239
50-54	3,825	687,625	556.3	54,643	304	62,716	349
55-59	4,775	554,943	860.4	49,077	422	48,454	417
60-64	5,711	453,728	1258.7	42,403	534	38,793	488
65-69	7,401	406,275	1821.7	34,406	627	34,264	624
70-74	8,485	377,438	2248.0	26,789	602	31,773	714
75-79	7,525	313,294	2401.9	18,871	453	26,999	648
80-84	5,355	214,830	2492.7	11,241	280	17,842	445
85+	4,271	186,517	2289.9	7,435	170	15,508	355
Total	55,166	12,069,774		1,000,000	3,931	1,000,000	4,691

Crude Rate: A (total) ÷ B (total)) x 100,000 = 457.1 per 100,000
AAR (1970): E (total) ÷ D (total) x 100,000 = 393.1 per 100,000
AAR (2000): G (total) ÷ F (total) x 100,000 = 469.1 per 100,000

Source: Illinois Department of Public Health, Illinois State Cancer Registry, October 30, 2000

Table 1.
Comparison of Crude and Age-adjusted Rates (AAR)
Using 1970 and 2000 Standard Populations for the
Major Cancer Control Sites by Race/Ethnicity, Illinois, 1998

All Races	Cases	AAR (1970)	AAR (2000)
Colon and Rectum#	7,147	48.4	60.7
Lung and Bronchus#	8,344	60.5	71.1
Female Breast	8,538	111.9	132.3
Cervix	727	9.6	11.6
Prostate	7,342	124.4	147.1
Whites	**Cases**	**AAR (1970)**	**AAR (2000)**
Colon and Rectum#	6,042	46.8	58.8
Lung and Bronchus#	6,962	58.1	68.5
Female Breast	7,186	111.1	131.1
Cervix	538	8.6	10.3
Prostate	5,725	111.0	131.6
Blacks	**Cases**	**AAR (1970)**	**AAR (2000)**
Colon and Rectum#	900	57.6	71.9
Lung and Bronchus#	1,181	76.8	89.3
Female Breast	1,043	108.7	129.7
Cervix	162	15.7	18.6
Prostate	1,120	183.3	218.1
Asian/Other Races	**Cases**	**AAR (1970)**	**AAR (2000)**
Colon and Rectum#	102	30.9	39.6
Lung and Bronchus#	115	35.6	42.6
Female Breast	145	66.1	76.8
Cervix	19	8.2	10.1
Prostate	75	55.8	66.7
Hispanics	**Cases**	**AAR (1970)**	**AAR (2000)**
Colon and Rectum#	161	24.4	30.1
Lung and Bronchus#	165	27.1	32.5
Female Breast	268	67.0	78.4
Cervix	86	16.2	20.1
Prostate	207	78.1	95.7
Non-Hispanics	**Cases**	**AAR (1970)**	**AAR (2000)**
Colon and Rectum#	6,986	49.5	62.0
Lung and Bronchus#	8,179	62.2	73.0
Female Breast	8,270	114.2	135.0
Cervix	641	9.2	11.0
Prostate	7,135	127.0	149.8

 # Both Sexes
Rates are per 100,000 population.
AAR (1970) rate is age-adjusted to the 1970 standard population.
AAR (2000) rate is age-adjusted to the 2000 standard population.

Source: Illinois Department of Public Health, Illinois State Cancer Registry, October 30, 2000

Illinois State Cancer Registry

Reporting Reminders

- Electronic submissions postmarked after September 30, 2001, must be in the NAACCR version 9 exchange layout; data in NAACCR version 6 will be returned.
- Use ICD-O-2 for coding topography and morphology for cases diagnosed prior to January 1, 2001. Use ICD-O-3 for cases diagnosed on or after January 1, 2001, or if date of diagnosis is unknown but patient was admitted or first seen on or after January 1, 2001.
- Use SEER Summary Stage 1977 for cases diagnosed prior to January 1, 2001, and SEER Summary Stage 2000 for cases diagnosed on or after January 1, 2001, or if date of diagnosis is unknown but patient was admitted or first seen on or after January 1, 2001.

Occupational Disease Registry

Jeff Wamack joined the Occupational Disease Registry in July as a coder/editor for the Occupational Safety and Health Survey. Jeff worked previously with the agency conducting telephone interviews with employers. We all welcome Jeff to the staff.

Adverse Pregnancy Outcomes Reporting System

The APORS program is changing the format for its surveillance report on infants prenatally exposed to controlled substances. The quarterly tabular report will be replaced by an annual report. The new report will provide state and county incidence rates as well as other analysis findings. This new report will be available in the late summer.

What's Up? (recent additions to the Department Web Site)

Maxfield R, Shen T. Survey of Workplace Injuries and Illnesses Illinois 1999. Epidemiologic Report Series 01:3 Illinois Department of Public Health, June 2001.

Illinois Health and Hazardous Substances Registry Newsletter (Illinois Department of Public Health), Summer 2001. This issue includes an article Work-related Farming Fatalities, Registry updates and *The Epi Inquirer.*

The Epi Inquirer

What is a population-based registry?

A registry is a public health surveillance system that collects data on all cases of particular diseases or health-related conditions. A population-based registry is a centralized data collection system covering a known population, usually residents of a well defined geographic area. All components of the Illinois Health and Hazardous Substances Registry (IHHSR) – cancer, birth defects, and occupational diseases and injuries – are population-based registries that cover the entire state of Illinois.

As compared to other types of registries, such as hospital- or clinic-based registries, population-based registries are considered to be much more useful for epidemiologic purposes. Because the area covered is clearly defined, the population denominator is often known from a census or other external sources, which makes the calculation of incidence rates possible. Also, population-based registries can serve as a platform to launch population-based scientific studies (e.g., population-based or nested case-control studies). Results from such studies are readily generalizable to the general population.

I heard that age-adjusted rates published by the IHHSR will soon be standardized to the 2000 population. What are the implications of this change?

As discussed in a previous newsletter (IHHSR, summer 2001), age adjusted rates reduce the "distortion" caused by different age distributions of populations. Age adjustment is typically done by standardizing the age distribution to an external or standard population. Currently, several population standards exist and the arbitrary choice of any one of them creates confusion among data users and imposes an unnecessary burden on surveillance systems that often have to produce multiple data series to meet different needs. Using the 2000 population as a single new standard population will provide much-needed consistency and efficiency for various data reporting tasks. To conform to national standards, IHHSR will be reporting its age-adjusted rates standardized to the 2000 standard population beginning with the 1999 data.

Age adjustment can standardize but not eliminate the effect of age distribution. As such, switching from existing standard years (e.g., 1940, 1970 or 1980) to the 2000 standard year would produce discrepancies and changes in rates that would be expected when expressing rates with different standard populations. Because the new standard represents closely the contemporary population structure, the new rates will be close to the crude rates. Also, because the current population is older, diseases typically associated with older populations will see an artificial "increase" in rates while diseases associated with younger populations will see a "decrease." (For changes in cancer rates, see in this issue an article titled "Changes in age-adjusted cancer incidence rates associated with age-adjustment using the 2000 U.S. population standard"). Estimates of disease disparities and trends will also be affected. Some early

evidence has shown that trends in cancer incidence and mortality, and estimates of health disparities across population subgroups, will change significantly with the new standard. Thus, careful interpretation of these changes is needed to distinguish statistical artifacts from true patterns.

How does IHHSR protect confidentiality for the data it collects?

The identity of patients and reporting facilities are vigorously guarded at IHHSR, as required by law. Four types of measures are currently in place to protect data confidentiality at various stages of the system: physical, electronic, procedural and statistical controls. The physical controls refer to locking up and limiting access to data/records and promptly shredding working documents with personal information. The electronic controls include assigning and updating passwords, designating special servers and encrypting transmitted data. The procedural controls include requiring all staff to sign confidentiality protection forms, setting up standard procedures to review and approve confidential data requests from researchers, and constantly monitoring the security of the system and correcting problems. The statistical controls refer to published reports and public use files. These include removing personal identifiers, reducing the frequency of single cases in data files, and suppressing small cells associated with small geographic areas. Over more than a decade of operation, these measures have allowed the IHHSR to serve the information needs of the public while simultaneously protecting an individual's right to privacy.

More questions? Send them to The Epi Inquirer, Division of Epidemiologic Studies, 605 W. Jefferson St., Springfield, IL 62761, or email at <tshen@idph.state.il.us>.

REGISTRY NEWSLETTER

Printed by Authority of the State of Illinois
P.O. 542237 1,350 10/01

The REGISTRY NEWSLETTER is published by the Division of Epidemiologic Studies, Illinois Department of Public Health, 605 W. Jefferson St., Springfield, IL 62761, 217-785-1873, TTY (hearing impaired use only) 800-547-0466.

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