



Statistical Notes

From the CENTERS FOR DISEASE CONTROL AND PREVENTION/National Center for Health Statistics

Revisions to *Healthy People 2000* Baselines

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Introduction

Healthy People 2000 (1) presents 523 specific (unduplicated) objectives and special population subobjectives to improve the health of Americans by the year 2000. (Hereafter, both objectives and special population subobjectives will be called "objectives".) While measurability was a key component in the establishment of these objectives, the immediate availability of baseline data and a data source to monitor progress toward the targets was not mandatory. Indeed, at the time of publication, *Healthy People 2000* included 91 objectives without baseline data points, and many more with only partial baselines. Since the publication of *Healthy People 2000*, 39 objectives that were without baselines now have at least baseline data. The number of objectives with baselines will increase as new data become available.

In the course of identifying specific data sources and quantifying data definitions for each objective, the National Center for Health Statistics (NCHS) identified numerous objectives for which the baselines specified in *Healthy People 2000* required revision. In addition, the availability of new data (for example, the 1990 Census) has resulted in the need for further refinements.

In February 1993, the Public Health Service (PHS) *Healthy People 2000* Steering Committee accepted the NCHS recommendation to revise the baselines for approximately 100 objectives (Table 1). The magnitude

of these changes varied considerably. Some revisions had little or no impact; others were substantial. In many cases, the baselines were revised to assure comparability between the baseline measure and the data that will be used to track progress toward the year 2000 targets.

These revisions can be grouped into several categories:

- Baselines for most of the population-based mortality objectives were updated using intercensal population denominators based on the 1990 Census enumeration. Although all of the applicable death rates were recomputed, in some cases the recomputed baseline rate is the same as the original.
- The baselines for several American Indian/Alaska Native mortality objectives were revised to reflect both the new intercensal populations and to include the entire United States American Indian/Alaska Native population.
- In priority area 14 (Maternal and Infant Health), 11 subobjective baselines were revised to reflect a change in the method of tabulating births based on the race of the mother instead of the race of the child.
- For the remaining objectives requiring revision, changes were made for a variety of methodological and computational reasons.

These four categories of changes are discussed in greater detail below.



Table 1. Healthy People 2000 original and revised baselines

[Unless otherwise specified, the base of the revised baseline (i.e. rate per 100,000, percent, etc.) is the same as the original published in *Healthy People 2000*. Duplicate objectives are indicated by []]

Objective number	Baseline		Reason for revision ¹
	Original	Revised	
1.1 [2.1,3.1,15.1]	135	No change	Population denominators
1.1a [2.1a,3.1a,15.1a]	163	168	"
1.3 [15.3] 5 or more	22	No change	Methodology
1.3 [15.3] 7 or more	12	16	"
2.2 [16.1]	133	134	Population denominators
3.2 [16.2]	37.9	38.5	"
3.3	18.7	18.9	"
4.1a	52.2	40.4	Expanded to include all U.S. American Indians-Alaska Natives
4.2	9.1	9.2	Population denominators
4.2a	22	22.6	"
4.2b	25.9	20.5	Expanded to include all U.S. American Indians-Alaska Natives/population denominators
4.3	3.8	No change	Population denominators
6.1 [7.2]	11.7	No change	"
6.1a [7.2a]	10.3	10.2	"
6.1b [7.2b]	25.2	No change	"
6.1c [7.2c]	46.1	46.7	"
6.1d [7.2d]	15	20.1	Expanded to include all U.S. American Indians-Alaska Natives/population denominators
6.3	12	20	Diagnostic category inclusions/data year
6.5	42.6	44.2	Transcription error
6.9	21	24	"
7.1	8.5	No change	Population denominators
7.1a	3.9	No change	"
7.1c	90.5	91.1	"
7.1d	53.1	41.3	"
7.1e	20.0	20.2	"
7.1f	14.1	11.2	Expanded to include all U.S. American Indians-Alaska Natives/population denominators
7.3	14.8	No change	Population denominators
7.3 (firearms)	12.9	13.0	"
7.3 (knives)	1.9	1.8	"
7.6	11.1	9.7	Original based on preliminary analysis
8.1 [17.1,21.1]	62	64.0	Methodology/data year
8.1a [17.1a,21.1a]	56	No change	"
8.1b [17.1b,21.1b]	62	66.9	"
8.1c [17.1c,21.1c]	12	11.9	"
8.2	79	83	Age group/data year/data source
8.12	66	68	Methodology/data year
9.1	34.5	34.7	Population denominators
9.1a	82.6	66.0	Expanded to include all U.S. American Indians-Alaska Natives/population denominators
9.1b	64.9	68.0	Population denominators
9.1c	53.6	49.8	"
9.2	887	832	Diagnostic category inclusions
9.3	18.8	19.2	Original based on preliminary analysis
9.3d	46.8	37.7	Expanded to include all U.S. American Indians-Alaska Natives/population denominators
9.3f	3.1	2.8	Original based on preliminary analysis
9.4	2.7	No change	Population denominators
9.4a	18	18.1	"
9.4b	131.2	133.0	"
9.4c	8	8.1	"
9.5	2.1	No change	"
9.5a	4.2	4.3	Population denominators
9.5b	4.5	No change	"
9.5c	6.6	No change	"
9.6	1.5	1.7	"
9.6a	4.4	4.5	"
9.6b	4.4	4.9	"
9.6c	5.7	6.4	"
9.6d	3.4	3.3	"
9.6e	17	26	Methodology
9.8	103	108	Diagnostic category inclusions
9.8a	650	648	"
9.9	125	118	"
9.10	5.9	5.3	"
9.10a	8.9	9.6	"
10.5 [20.3e]	6,200	3,090	Original based on preliminary analysis

Table 1. Healthy People 2000 original and revised baselines—Con.

[Unless otherwise specified, the base of the revised baseline (i.e. rate per 100,000, percent, etc.) is the same as the original published in *Healthy People 2000*. Duplicate objectives are indicated by []—Con.

Objective number	Baseline		Reason for revision ¹
	Original	Revised	
11.7 (200 list)	2.62	3.50	Original based on preliminary analysis expanded categories
11.7 (250 list)	...	4.48	"
11.7 (carcinogens)	0.32	0.48	"
11.10 (rivers/lakes/estuaries)	25	...	"
11.10 (rivers)	...	30	"
11.10 (lakes)	...	26	"
11.10 (estuaries)	...	28	"
13.7 (men)	12.1	13.6	Population denominators
13.7 (women)	4.1	4.8	"
13.9	62	61	Original based on preliminary analysis
14.1a	17.9	18.8	Revised definition of race
14.1b	12.5	13.4	"
14.1e	11.7	12.3	Revised definition of race
14.1h	6.1	6.4	"
14.1i	6.5	7.0	"
14.2a	12.8	13.5	"
14.3a	14.2	14.9	"
14.5a	12.7	13.0	"
14.5b	2.7	2.8	"
14.6	67	68	Original could not be duplicated
14.11a	61.1	60.8	Revised definition of race
14.11b	60.2	57.6	"
15.2	30.3	30.4	Population denominators
15.2a	51.2	52.5	"
15.3	13.9	14.4	Original based on preliminary analysis
15.3a	32.4	34.0	"
16.3	22.9	23.0	Population denominators
16.4	2.8	No change	"
16.5	14.4	14.7	"
17.9	38	No change	"
17.9a	65	67	"
17.9b	54	46	Expanded to include all U.S. American Indians-Alaska Natives/population denominators
17.10c	10.2	8.8	Data year
17.11 (prevalence)	28	No change	"
17.11 (incidence)	2.9	No change	"
18.1	44,000–50,000	48,400	Original based on preliminary analysis
18.1a	26,000–28,000	27,800	Original based on preliminary analysis
18.1b	14,000–15,000	14,500	"
18.1c	7,000–8,000	8,200	"
18.6	25–30	30.8	"
19.4	100	44.7	"
19.5 (genital herpes)	167,000	163,000	Methodology
19.5 (genital warts)	451,000	290,000	"
19.7 [20.3b + 20.3c]	58,300	47,593	Original based on preliminary analysis
19.10a	25	26	Transcription error
20.3 (hepatitis A)	31	33	Original based on preliminary analysis
20.3a	30,000	44,348	"
20.3b	33,000	33,995	"
20.3c	25,300	13,598	"
20.3d	8,900	10,817	"
20.3f	3,500	3,863	"
20.6 (hepatitis A)	1,280	4,475	"
20.6 (malaria)	2,000	932	Data year
20.7	6.3	6.5	Transcription error
20.9	131	135.4	Original could not be duplicated
20.10 (65 years and over)	48	19.1	"
20.10 (less than 5 years)	27	29.4	"
20.11 (less than 2 years)	70–80	54–64	Methodology
20.11 (children in child care facilities)	94	94–95	Data presentation
20.11 (children in kindergarten through post secondary schools)	97	97–98	Data presentation
20.11 (non-institutional)	10–20	14–30	Methodology/data year
21.13	10	10–49	Data presentation/data year
22.2	23	22	Data year

¹See text for details.

Table 2. Healthy People 2000 mortality objectives revised using intercensal population estimates

Objective number	Cause of Death ¹	ICD-9 Identifying Codes
1.1	Coronary Heart Disease	410-414, 402, 429.2
1.1a	[Blacks]	
2.1	See 1.1	
2.1a	See 1.1a	
2.2	Cancer (all sites)	140-208
3.1	See 1.1	
3.1a	See 1.1a	
3.2	Lung cancer	162.2-162.9
3.3	Chronic obstructive pulmonary disease	490-496
4.2	Cirrhosis	571
4.2a	[Black males]	
4.2b	[American Indians/Alaska Natives]	
4.3	Drug-related deaths	292, 304, 305.2-305.9, E850-E858, E950.0-E950.5, E962.0, E980.0-E980.5
6.1	Suicides	E950-E959
6.1a	[Ages 15-19]	
6.1b	[Males 20-34]	
6.1c	[White males 65 and older]	
6.1d	[American Indian/Alaska Native males]	
7.1	Homicides	E960-E969
7.1a	[Children 0-3]	
7.1b	[Spouses 15-34]	
7.1c	[Black males 15-34]	
7.1d	[Hispanic males 15-34]	
7.1e	[Black females 15-34]	
7.1f	[American Indians/Alaska Natives]	
7.2	See 6.1	
7.2a	See 6.1a	
7.2b	See 6.1b	
7.2c	See 6.1c	
7.2d	See 6.1d	
7.3	Firearm injuries	E922.0-E922.3, E922.8-E922.9, E955.0-E955.4, E965.0-E965.4, E970, E985.0-E985.4
	Knife injuries	E920.3, E956, E966, E986, E974
9.1	Unintentional injuries	E800-E949
9.1a	[American Indians/Alaska Natives]	
9.1b	[Black males]	
9.1c	[White males]	
9.3d	Motor vehicle crashes	E810-E825
	[American Indians/Alaska Natives]	
9.4	Falls and fall-related injuries	E880-E888
9.4a	[Ages 65-84]	
9.4b	[Ages 85 +]	
9.4c	[Black males 30-69]	
9.5	Drowning	E830, E832, E910
9.5a	[Ages 0-4]	
9.5b	[Males 15-34]	
9.5c	[Black males]	
9.6	Residential fires	E890-E899
9.6a	[Ages 0-4]	
9.6b	[Ages 65 and older]	
9.6c	[Black males]	
9.6d	[Black females]	
13.7	Cancer of the oral cavity and pharynx	140-149
15.1	See 1.1	
15.1a	See 1.1a	
15.2	Stroke	430-438
15.2a	[Blacks]	
16.1	See 2.2	
16.2	See 3.2	
16.3	Breast cancer in women	174
16.4	Cancer of the uterine cervix	180
16.5	Colorectal cancer	153.0-154.3, 154.8, 159.0
17.9	Diabetes-related deaths ²	250
17.9a	[Blacks]	
17.9b	[American Indians/Alaska Natives]	

¹Healthy People 2000 uses underlying cause of death, unless otherwise specific

²Healthy People 2000 uses multiple-cause of death.

Reasons for baseline change

Revised intercensal population estimates

After each recent decennial population census, the United States Bureau of the Census has developed intercensal population estimates for the preceding decade to replace postcensal estimates. Intercensal population estimates are more accurate than postcensal estimates because they incorporate information about the population size at both the beginning and the end of the decade. Intercensal estimates have been prepared for the 1960's, 1970's, and 1980's to correct for the "error of closure" or difference between the estimated population at the end of the decade and the enumerated census count for that date. The error of closure at the national level was quite small during the 1960's (379,000). However, for the 1970's it was nearly 5 million. For the 1980's the error of closure was about 1.5 million.

The error of closure as a proportion of population tends to be comparatively small for the total United States population. However, the error can be substantial for small racial/ethnic subgroups (for example, American Indians/Alaska Natives) or for sub-national geographic areas. More information can be found in several U.S. Bureau of the Census publications (2,3).

The 1986-87 baselines for population-based mortality objectives tracked with data from the National Vital Statistics System (NVSS) originally used postcensal population estimates based on the 1980 census. These have been recomputed using intercensal population estimates based on the 1980 and 1990 Census enumerations. Data for the three mortality objectives (4.1, 9.3 (except 9.3d), and 10.1) tracked by sources other than the NVSS were not revised because of population adjustment.

With the exception of small population sub-groups (for example, American Indian/Alaska Native - see section below), the changes are relatively small. The objectives affected by this change are shown in Table 2.

American Indian and Alaska Native death rates

The baseline rates for some American Indian/Alaska Native (AI/AN) mortality objectives were revised to reflect both the intercensal populations and the inclusion of the entire United States AI/AN population. The objectives affected by this change are shown in Table A.

The original baselines and targets for these objectives were established using data from the 33 States in which AI/AN health services are provided by the federal Indian Health Service Regional Service Offices. While these "Reservation States" include approximately 90 percent of the AI/AN population in the United States, they exclude some urban centers with large American Indian populations. The revised baselines include data for the entire United States AI/AN population.

In most cases, the revised baselines are substantially lower than the original figures. IHS officials indicate that

Table A. American Indian/Alaska Native objectives revised to reflect intercensal populations and the entire United States American Indian/Alaska Native population

Objective	Subject
4.1a*	Alcohol-related motor vehicle deaths
4.2b	Cirrhosis deaths
6.1d/7.2d	Suicide deaths
7.1f	Homicide deaths
9.1a	Unintentional injury deaths
9.3d	Motor vehicle crash deaths
17.9b	Diabetes-related deaths

*Revised only for inclusion of entire U.S. AI/AN population.

these large differences are primarily due to the relatively greater failure to identify AI/AN deaths on death certificates in non-Reservation States compared with Reservation States. To a lesser extent they also reflect the larger (about 5%) intercensal population estimates for the baseline year based on the 1980 and 1990 Censuses compared with the postcensal estimates based on the 1980 Census.

Race definitions for natality/infant and maternal mortality

In 1989, NCHS changed the method of tabulating race-specific data on live births from a complex algorithm for determining race of child based on the race(s) of the parents, to simply using the race of the mother. This modification affects the race-specific natality objectives in *Healthy People 2000* Chapter 14 (Maternal and Infant Health) tracked using NVSS data. In addition, because live births comprise the denominator of infant (including neonatal and postneonatal) mortality, maternal mortality and fetal death rates, these rates are also affected. The specific objectives affected by the change to race of mother are shown in Table B.

The decision to modify the race-specific tabulation algorithm was influenced by three factors: the growing proportion of births for which no information on the father is reported, the increase in interracial parentage, and the topical content of the birth certificate, which was

Table B. Objectives revised to reflect the race of the mother

Objective number	Subject	Racial/ethnic subgroup
14.1a	Infant mortality	Black
14.1b	Infant mortality	AI/AN
14.1e	Neonatal mortality	Black
14.1h	Postneonatal mortality	Black
14.1i	Postneonatal mortality	AI/AN
14.2a	Fetal death	Black
14.3a	Maternal mortality	Black
14.5a	Low birth weight	Black
14.5b	Very low birth weight	Black
14.11a	Early prenatal care	Black
14.11b	Early prenatal care	AI/AN

expanded in 1989 to include considerable health and demographic information related to the mother.

Quantitatively, this change results in more white births and fewer births to the black population and other races. Therefore, the change in the denominators causes the infant mortality rates, fetal death rates, and maternal mortality rates to be lower for white infants and higher for infants of other races than they were when computed by the previous method. Conversely, population-based natality measures such as percent of babies with low birth weight and percent of mothers receiving early prenatal care tend to be higher for births to white mothers and lower for births to mothers of other races.

Because the race-specific objectives in Chapter 14 are now being tracked by race of mother, the original baselines for these objectives (by race of child) were recomputed to provide comparable trend comparisons. For more information about this issue see the 1989 Advance Report of Final Natality Statistics (4).

Other revisions

Baselines for about 50 unduplicated objectives were revised by the Public Health Service agency responsible for achieving the objectives; changes were made for various methodological and computational reasons, described below. It should be noted that some revisions involved more than one of these categories. The reason for the revision to each of these baselines is listed in Table 1.

- *Methodology/specific algorithm used*—A number of revisions resulted from modifications to the specific algorithm used to generate the data. For example, original baseline data for objective 1.3 (light to moderate physical activity) were derived from a complex regression algorithm (using Behavioral Risk Factor Survey data). Revised baseline data were derived by summing the number of reported physical activities which took at least 30 minutes (using National Health Interview Survey data). The change, recommended by the National Center for Chronic Disease Prevention and Health Promotion (Centers for Disease Control and Prevention), was an attempt to respond to the original intent of the objective, which is to encourage regular calorie-burning physical activity, irrespective of the type of activity.
- *Diagnostic category inclusions*—Baseline diagnostic code definitions were revised to reflect current methodology. All but one of these revisions involved data from the National Hospital Discharge Survey (NHDS). Table C presents a list of all *Healthy People 2000* objectives tracked by the NHDS using the Ninth Revision of International Classification of Diseases - Clinical Modification (ICD-9-CM) (5) codes. Baselines revised due to changes in diagnostic codes are denoted by (*).

The other baseline revised due to diagnostic code inclusions was for objective 6.3 (mental disorders

Table C. ICD-9 CM codes used for objectives tracked by the National Hospital Discharge Survey

Objective	Subject	ICD-9 CM codes
9.2*	All non-fatal injuries	800-959
9.7	Hip fractures	820
9.9*	Non-fatal head injuries	800-801,803-804,850-854, 870-873, 925
9.10*	Non-fatal spinal cord injuries	806, 952
11.1	Hospitalizations for asthma	493
14.7	Severe complications of pregnancy	630-676 minus 635
14.8	Cesarean births-total	74 (excluding 74.3 and 74.91)
14.8a	Cesarean births-primary	74 (excluding 74.3 and 74.91) - without 654.2
14.8b	Cesarean births-repeat	74 (excluding 74.3 and 74.91) - with 654.2
17.10	Lower extremity amputation among people with diabetes	84.11-84.12
19.6	Hospitalizations for pelvic inflammatory disease	614.0-614.5, 614.7- 614.9, 6.15.0, 615.1, 615.9, 098.10, 098.16, 098.17, 098.30, 098.36-098.37, 098.39, 098.86

*Healthy People 2000 baseline has been revised.

among children and adolescents). The original baseline was derived from a general category of childhood maladjustment rather than specific psychiatric diagnoses (6,7). The revised baseline uses the Diagnostic Statistical Manual (DSM III) which includes expanded diagnostic categories for children and adolescents (8,9). The target for this objective was proportionally adjusted by the National Institute for Mental Health (NIMH) to reflect the change in the baseline (see section below on "Target revisions").

- *Transcription errors*—Four baselines were corrected because the original figures were transcribed incorrectly from the source documents.
- *Data year/number of data years*—Several baselines were revised to reflect changes in the data year. For many of these, the change in data year resulted from a change in methodology or data source. For example, the original baseline for years of healthy life (8.1, 17.1, 21.1) was computed using 1980 data. The revised baseline uses 1990 data derived from the same data sources but based on a revised methodology.

The baselines for objective 17.11, (incidence and prevalence of diabetes), which were originally based on a single year (1987) of data, were revised to include multiple years (1986-88). The revised baselines are identical to the original baselines. Conversely, one baseline (17.10c - lower extremity amputations among black persons with diabetes), which was originally based on multiple years (1984-87), was revised to a single-year (1987) data point. These revisions were made to be consistent with the presentation of diabetes data in other PHS publications (10).

- *Data source*—In a few cases, the data source identified in *Healthy People 2000* will not be used for

tracking progress towards the targets. Therefore, the baselines were revised to reflect the new data source. For example, the baseline for objective 8.2 (high school graduation) originally came from the Current Population Survey, United States Bureau of the Census; the revised baseline data are from the National Center for Education Statistics (United States Department of Education).

- **Age group**—In addition to a change in data source noted above, one baseline revision (8.2 high school graduation) involved a change in the age group used to measure the objective. The original baseline was computed using the age group 19–20 years. The revised baseline, recommended by the PHS lead agencies responsible for achieving the objective, uses the age group 20–21 years.
- **Data presentation**—Three baselines were revised to reflect changes in the way the data are presented. Two baseline data points for 20.11 (immunization status of children in child care facilities and children entering schools) were revised from point estimates (averages of antigen-specific immunizations) to ranges that represent the percent immunized for specific antigens (diseases). The original baseline for objective 20.13 was the number of states with immunization laws for all antigens and all settings. The revised baseline shows the range in the number of states that have laws for specific antigens and types of facilities (child care as compared to school).
- **Original based on preliminary analysis**—A number of baselines published in *Healthy People 2000* were based on preliminary analyses. These measures were updated when more refined data became available. Several of these involved preliminary estimates of the number of diagnosed AIDS cases (objectives 18.1, 18.1a-c) measured by data ranges. The original range estimates have been replaced by more accurate point estimates.
- **Original could not be duplicated**—In a few cases, the figure published in *Healthy People 2000* could not be precisely duplicated using current methodology and inclusion categories. In these cases the current estimates are substituted for the original figures. The small differences between the original and revised figures are probably due to rounding or minor changes in methodology.

Many of the changes resulting from the methodological and computation refinements listed above were relatively small. However, several were substantial and therefore present a very different picture of the effort needed to achieve the year 2000 targets. For example, the original baseline for objective 20.6 (hepatitis A among international travelers) was 1,280. The *Healthy People 2000* text discussion mentioned an underreporting factor of 33 percent and estimated the total case count at about 5,000 infections. The revised baseline case count for hepatitis A

Table D. Objectives for which targets have been revised

Objective Number	Subject	Target		Reason
		Original	Revised	
6.3	Child/adolescent mental illness	10%	17%	Diagnostic category inclusions
7.6	Assault injuries	10%	8.7%	Original based on preliminary analysis

among international travelers (4,475) is adjusted to account for underreporting.

For more information on the change applicable to a specific objective, contact the *Healthy People 2000* staff at NCHS.

Target revisions

The baseline revisions described above have implications for the year 2000 targets published in *Healthy People 2000*. For some objectives the direction of the revised baseline is away from the target, implying that a greater level of effort will be required to achieve the target. For others, the revisions move the baselines closer to the year 2000 target. In fact, for several objectives, including a number of AI/AN objectives, the statistical adjustments yield baselines at or below the targets. As of this writing, except for objectives 6.3 and 7.6 which were revised by the lead PHS agency responsible for achieving the objectives (Table D), all *Healthy People 2000* targets are being shown as originally published.

The extent to which *Healthy People 2000* targets should be revised in light of these baseline revisions is a major policy decision. Therefore, the U.S. Public Health Service will be asking for public comment on revising the targets. As we move through the decade, every attempt will be made to be as consistent as possible in tracking the year 2000 objectives. However, as improvements in methodologies are made, as new data sources become available, and as definitions change (for example HIV/AIDS), the *Healthy People 2000* process will respond to these issues as appropriate in tracking the changing health status of all Americans.

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