

# CENSUS

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*and you*

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## Should the Census Bureau Use “Statistical Sampling” in Census 2000?

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Dr. Riche

by Dr. Martha Farnsworth Riche  
Director, U.S. Census Bureau

**Yes: A traditional head count will undercount minorities and many city dwellers.**

Considering that the first census was supervised by Thomas Jefferson, read by Benjamin Franklin and delivered to President George Washington, it is clear that surveys of America – who we are, where we live, what we do – are woven into the very fabric of this nation. On April 1, 2000, this fundamental element of the republic will be renewed with census day.

Our Constitution spells out the primary role of the decennial census, which is to establish an accurate, once-a-decade count of the population. The census also places our population in a particular location as of census day so Congress can be reapportioned and the state and local governments redistricted.

During the sixties and seventies two additional political developments increased the importance of decennial census data. The Voting Rights Act of 1965 and subsequent court opinions used census data as a yardstick to implement “one-person, one vote” principles. And, the federal assistance

initiatives of the seventies used decennial census data as the baseline indicator for billions of dollars of annual federal aid that still flow to state and local governments.

Given these uses, it should not be surprising that the Census Bureau’s plans for a more accurate Census 2000 have come under attack.

In 1990, a number of troubling trends occurred regarding the census. The 1990 census undercounted approximately 4 million people, about the same number who were counted all together in the first census 200 years ago. Even more troubling, this last census was, for the first time in history, less accurate than its predecessor.

The undercount of the population was 33 percent greater than the undercount in the 1980 census.

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## Statistical Sampling in Census 2000?

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And, as before, the 1990 undercount was not uniform across the population. African-Americans, Hispanics, Asians, and American Indians were missed at a much greater rate than Whites. Finally, the cost of the census escalated sharply. Even after accounting for inflation and the greater population, the 1990 census cost twice as much as the 1970 census. In large part this was due to the significant decline in the percentage of households that returned the questionnaire and the resulting need for more extensive follow-up procedures utilizing hundreds of thousands of census-takers going door to door.

Congress concluded that the 1990 census failed on two grounds: It cost too much and measured too few people.

It's easy to figure the cost increase: you just take the total cost of the census, divide it by the number of households counted and adjust for inflation. The 1970 census cost \$10

per household (in 1990 dollars); the 1990 census cost \$25.

It's harder to see how far the census falls short of measuring all the people, but the Census Bureau has been doing it since 1940 using records such as birth and death certificates as an independent check. For example, in 1940, 3 percent more draft-age men showed up for the draft pool than the census found including 13 percent more Black men. Although all census directors knew the census never counted everybody, this was the first measured knowledge that the undercount was higher for minorities.

In response to these developments, bipartisan legislation in Congress created a special panel of experts in 1992 at the National Academy of Sciences to study the mounting problems regarding census accuracy and cost issues. In 1994 the congressionally mandated panel, composed of nationally recognized experts in the

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Charlotte	704-344-6144
TDD	704-344-6548
Chicago	708-562-1740
TDD	708-562-1791
Dallas	214-640-4470
TDD	214-640-4434
Denver	303-969-7750
TDD	303-969-6769
Detroit	313-259-1875
TDD	313-259-5169
Kansas City	913-551-6711
TDD	913-551-5839
Los Angeles	818-904-6339
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New York	212-264-4730
TDD	212-264-3863
Philadelphia	215-597-8313
TDD	215-597-8864
Seattle	206-728-5314
TDD	206-728-5321

## CENSUS 2000

### Statistical Sampling?

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fields of demography and statistics, reached three basic conclusions:

First, the academy declared, "It is fruitless to continue trying to count every last person with traditional census methods of physical enumeration. Simply providing additional funds to enable the Census Bureau to carry out the 2000 census using traditional methods, as it has in previous censuses, will not lead to improved coverage or data quality."

Second, the academy concluded that "it is possible to improve the accuracy of the census count with respect to its most important attributes by supplementing a reduced intensity of traditional enumeration with statistical estimates of the number and characteristics of those not directly enumerated."

Third, the academy added that "once a decision is made to use statistical enumeration for completing the count, a thorough review and reengineering of census procedures and operations could achieve substantial cost savings in the next census, even as accuracy is being improved."

The panel accordingly recommended that "[e]fforts to follow up individually those who fail to return the mail questionnaire should be simplified and truncated after a reasonable effort based on several criteria ... and statistical sampling should be used to estimate the number and characteristics of the nonrespondent households that remain. In addition, evaluation surveys should be undertaken to improve the overall

count and reduce the differential undercount."

The conclusions of this panel have been reaffirmed by a second panel that issued interim reports in 1992 and 1996, finding that the use of sampling techniques is "critical to the success of the year 2000 census." A decennial census that "reduces costs, reduces

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***"It is fruitless to continue trying to count every last person with traditional census methods of physical enumeration."***

– National Academy of Sciences

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nonresponse bias, increases accuracy and reduces differential undercoverage can[not] be conducted" without the use of sampling, the most recent report concluded.

Moreover, failing to include sampling as an element of Census 2000 would produce results worse than those obtained for the 1990 census. The panel added, "It is likely that repeating 1990 methods with the same relative level of resources to conduct the 2000 census will yield results that are of worse quality than obtained in 1990 and that have bias and undercoverage problems of unknown size and direction."

Based on the expert recommendations of the National Academy of Sciences, the Census Bureau first outlined its plans for a reengineered Census 2000 in February 1996. The bureau's plan called for a simpler, less costly, more accurate census.

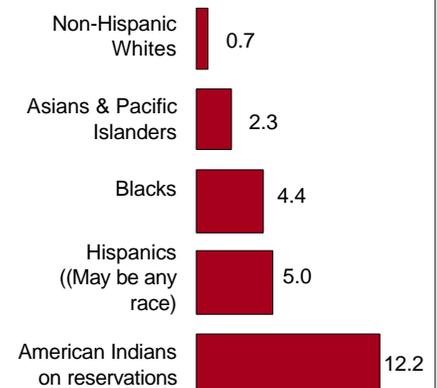
The bureau announced a variety of reengineered initiatives recommended by the 1994 report. These ranged from increased use of technology to tabulate better data, to better and more wide-ranging mapping and address-listing with the help of the U.S. Postal Service and local governments. The bureau also redesigned its census questionnaire to ensure that it was user-friendly and announced its plans to have the Census 2000 questionnaire available in post offices and community meeting places for wider distribution. Finally,

*Continued on page 4*

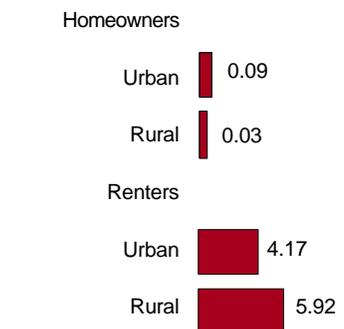
### Census 2000 Aims at Reducing the Undercount

Percent of net undercount for 1990

#### Race Groups and Hispanics



#### Homeowners and Renters



## Statistical Sampling?

*Continued from page 3*

the bureau's Census 2000 plans call for an intensive direct-mail campaign involving mailing and, for the first time, resending the questionnaire to every household, as well as a widely advertised toll-free number to accept response by phone for the first time.

However, as the academy recommended, the linchpin of the bureau's Census 2000 reengineering involves scientific sampling to increase accuracy and reduce costs.

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***“The bureau’s plans call for an aggressive program to count 90 percent of every neighborhood and then to account for the rest through scientific sampling techniques. . . .”***

*– Martha Farnsworth Riche*

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The bureau's plans call for an aggressive program to count 90 percent of every neighborhood and then to account for the rest through scientific sampling techniques first utilized by the bureau in the 1940 census. The Census 2000 plans also call for a nationwide, but state by state, 750,000-household quality check of the population to ensure accuracy right down to the local level and to eliminate the differential undercount.

Critics of the Census 2000 plan have raised three major concerns:

**Cost.** Congressional critics say they are willing to write a “blank check” to

cover the costs of a traditional census plan. However, the bureau estimates that the additional costs would range from \$675 million to \$800 million for a traditional head count over and above the \$4 billion already planned for Census 2000. And it still would yield a less accurate census than the 1990 census.

**Accuracy.** The bureau can give no assurances that increasing its Census 2000 budget dramatically to implement a 1990-style census would lead to increased accuracy. Quite the opposite, the bureau believes that accuracy at all levels, including the local level, again would decline using the old methods. As Barbara Bryant, the census director in the Bush administration says, “Throwing more money and more temporarily hired census-takers at the job of enumeration will not find the missing! After many local governments complained of undercounted blocks in 1990, we expensively sent the best-trained enumerators out to comb and recomb thousands of disputed blocks. This costly effort netted less than one-half percent addition.”

**Constitutionality.** The Department of Justice, under the Carter, Bush and Clinton administrations, has issued three opinions regarding the constitutionality and legality of sampling in the decennial census. All three opinions concluded that the Constitution and relevant statutes permit the use of sampling in the census. Most federal courts that have addressed this issue have held that the Constitution and federal statutes allow sampling.

The Census Bureau has a well-deserved reputation for non-partisan, expert collection of data. The bureau's most important concern for Census 2000 is accuracy. In the early 1800s

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***“Throwing more money and more temporarily hired census-takers at the job of enumeration will not find the missing!”***

*– Barbara Bryant, former director*

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federal marshals on horseback rode to the country's frontier to collect census information as best they could at county gatherings and court days.

Throughout most of this century housewives and college students fanned out across America to take a census that was appropriate for rural and small-town America.

In 2000 our methods are to adapt to a largely urban population. We also must account for those in our country who come from traditionally hard-to-count populations or who follow the crops, work the third shift, refuse to answer the census or cannot be found. Scientific sampling will provide this accounting.

As the inspector general of the Department of Commerce states, “If carefully planned and implemented, sampling can be employed by the bureau in the 2000 census to produce overall more accurate results than were produced in the 1990 census, at an acceptable cost.”

For Census 2000 the continuing quest for an accurate and cost-effective decennial census must include scientific sampling to supplement the bureau's extensive plans for a physical enumeration of the population. Only then will the American people get the fair, accurate census they deserve.

## State Tax Revenue Comes Mainly From Sales and Income Taxes

In 1996, the nation's state governments collected \$418.6 billion in tax revenues. About \$139.3 billion (33 percent) came from general sales tax and \$134.3 billion from individual income tax. An additional \$66.3 million came from selective sales taxes (so-called "sin taxes" and others such as taxes on motor fuels sales).

As the maps show, states vary widely in the amounts that sales tax and income tax cost individuals. Massachusetts has the highest per capita income tax; Hawaii, which also has a high per capita income tax, has the highest per capita sales tax.

Source: *1996 Annual Survey of State Government Tax Collections*.  
<[www.census.gov/govs/statetax/96tax.txt](http://www.census.gov/govs/statetax/96tax.txt)>.

### Contact:

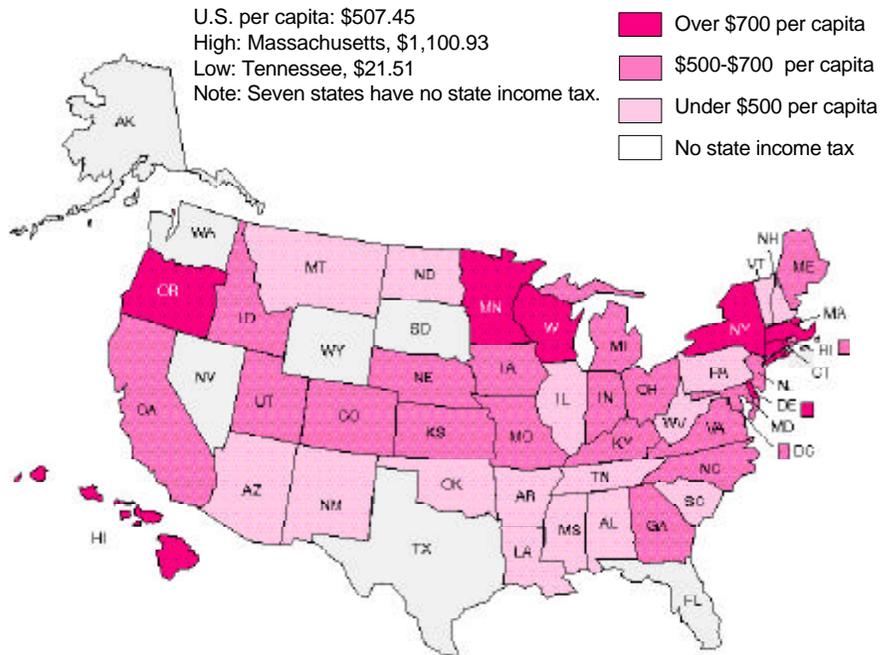
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### Spare Change?

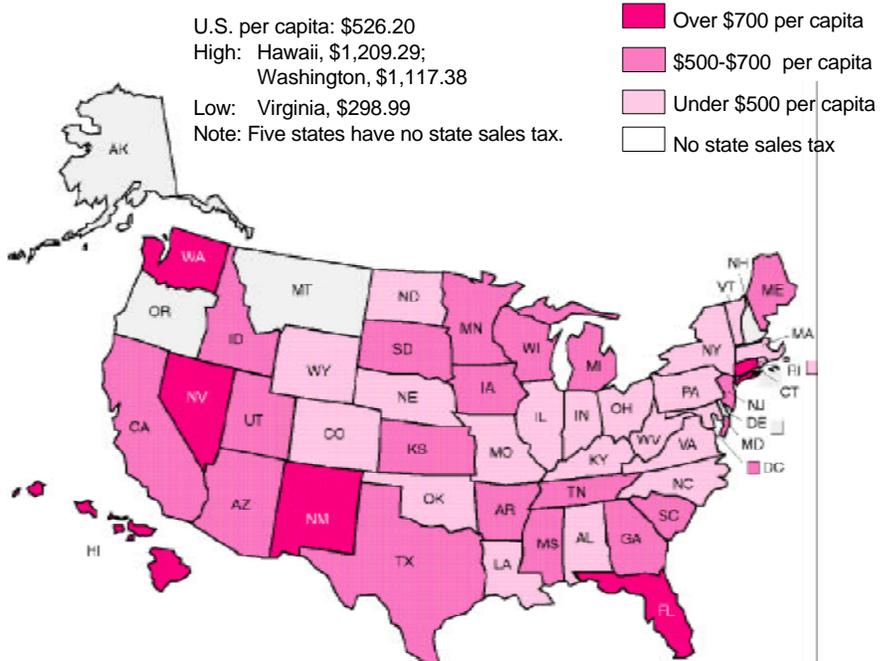
In 1996, America had 45 companies manufacturing about 787,517 coin-operated vending machines, worth \$815 million. About 63 percent were beverage machines; another third were food or snack machines.

Source: *Vending Machines (Coin-Operated): 1996, Series MQ35U(96)-1*. <[www.census.gov/industry/ma35u96.txt](http://www.census.gov/industry/ma35u96.txt)>.

### Per Capita State Income Tax Highest in Massachusetts: 1996



### Per Capita State Sales Tax Highest in Hawaii: 1996



Source: U.S. Census Bureau, Department of Commerce, *1996 Annual Survey of State Government Tax Collections*.

## Sweet Sixteen

In October 1995, almost 95 percent of 16-year-olds were enrolled in school. Most of those enrolled were in their third year of high school (60 percent); 27 percent were in their sophomore year; 7 percent were seniors, and 5 percent were freshmen.

This information comes from *School Enrollment – Social and Economic Characteristics of Students: October 1995 (Update)*. One table shows the school enrollment of people by single years of age up to 25 and by age groups thereafter. The table shows the number in each grade of school – nursery school through college.

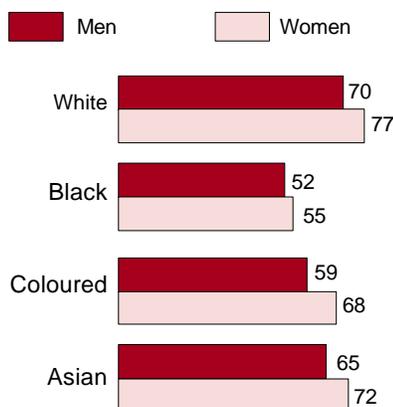
Source: <[www.census.gov/population/www/socdemo/school.html](http://www.census.gov/population/www/socdemo/school.html)>. Print (\$31.40, call 301-457-2422).

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### Vast Differences in Life Expectancy for Race Groups in South Africa

Life expectancy at birth: 1997



Source: U.S. Census Bureau, Department of Commerce, *Ageing Trends: South Africa*.

### High School Daze

Teenagers in high school by single years of age: October 1995  
(Numbers in thous.)

Age	Popu- lation	Enrolled					
		Total		Year of High School			
		No.	Pct.	1	2	3	4
13	3,811	3,773	99.0	174	2	5	1
14	3,816	3,771	98.8	2,452	211	8	3
15	3,922	3,879	98.9	1,131	2,357	215	15
16	3,806	3,598	94.6	189	963	2,171	241
17	3,673	3,399	92.6	38	181	869	2,154
18	3,687	2,454	66.6	16	21	151	774
19	3,511	1,820	51.8	–	19	39	143

– Represents zero.

Source: U.S. Census Bureau, Department of Commerce, *School Enrollment – Social and Economic Characteristics of Students: October 1995 (Update)*, Series PPL-55.

## Race and Life Expectancy in South Africa

In South Africa's post-apartheid era, vast differences in living conditions persist among the nation's racial groups. One major way the races differ is in life expectancy.

Overall life expectancy at birth in South Africa is estimated to be 54 years for men and 58 years for women. However, life expectancy for White South African women, which exceeds that of women in some European nations, is 22 years higher than for Black South African women (77 years as opposed to 55 years). White men have a life expectancy 18 years higher than Black men (70 years versus 52 years).

The low life expectancy for the Black population reflects, to some extent, the growing impact of the HIV/AIDS epidemic.

Once people reach age 60, however, the differences between groups lessen as they do in most countries.

These findings come from *Ageing Trends: South Africa*. The brief has information on health, health care coverage and facilities, educational attainment, literacy, marital status, employment, poverty and pension coverage.

Source: *Ageing Trends: South Africa*, International Brief, Series IB/97-2 <[www.census.gov/ipc/www/publist.html](http://www.census.gov/ipc/www/publist.html)>. Print (301-457-1351).

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### Census 2000 Operational Plan

Copy: <[www.census.gov/dmd/www/newplan.html](http://www.census.gov/dmd/www/newplan.html)>

Print: 301-457-2000

Information: 301-457-3947

## U.S. STATISTICS AT A GLANCE

### Economic Indicators

		Latest data	Unit	Latest month	Previous month	Last year	Percent change from previous	
							month	year
<b>Business</b> .....				<i>Sources: Census Bureau, Federal Reserve Board</i>				
Retail:	Sales	June	\$Bil.	210.3	209.3	204.4	0.5	2.9
	Inventory	May	\$Bil.	317.3	317.6	305.6	-0.1	3.8
	Inv./sales ratio	May	Ratio	1.52	1.51	1.50	(X)	(X)
Consumer installment credit		May	\$Bil.	1,224.1	1,221.1	1,148.3	0.2	6.6
Merchant wholesalers:	Sales	May	\$Bil.	210.4	209.9	200.1	0.2	5.1
	Inventory	May	\$Bil.	258.7	258.0	256.7	0.2	0.8
	Stock/sales ratio	May	Ratio	1.23	1.23	1.28	(X)	(X)
<b>Construction and Housing</b> .....				<i>Sources: Census Bureau, Federal Housing Finance Board</i>				
Residential:	Building permits – AR	June	1,000	1,395	1,432	1,432	-2.6	-2.6
	Housing starts – AR	June	1,000	1,452	1,385	1,488	4.8	-2.4
	New home sales – AR	June	1,000	819	772	732	6.1	11.9
	New home mortgage rate – NSA	June	Pct.	7.95	8.01	8.05	-0.7	-1.2
New construction:	Total expenditures – AR	June						
	Current dollars		\$Bil.	591.5	597.9	568.2	-1.1	4.1
	Constant (1992) dollars		\$Bil.	499.3	506.2	494.9	-1.4	0.9
<b>Manufacturing</b> .....				<i>Sources: Census Bureau, Federal Reserve Board</i>				
Durable goods:	Shipments	June	\$Bil.	179.4	175.9	166.9	2.0	7.5
	New orders	June	\$Bil.	180.7	176.4	170.0	2.4	6.3
	Unfilled orders	June	\$Bil.	498.5	497.2	475.4	0.3	4.9
Total goods:	Shipments	June	\$Bil.	326.4	323.6	308.9	0.9	5.7
	Inventories	June	\$Bil.	444.8	443.5	433.9	0.3	2.5
	Inv./ship ratio	June	Ratio	1.36	1.37	1.40	(X)	(X)
Index of industrial production		June	1992=100	119.9	119.5	115.5	0.3	3.8
<b>U.S. International Trade in Goods and Services</b> .....				<i>Source: Census Bureau</i>				
Exports of goods and services		May	\$Bil.	77.2	77.9	71.3	-0.8	8.4
Imports of goods and services		May	\$Bil.	87.5	86.6	81.3	1.0	7.7
Trade balance		May	\$Bil.	-10.2	-8.7	-10.0	17.0	2.6
<b>Money Supply, Prices, Interest Rates</b> .....				<i>Sources: Federal Reserve Board, Bureau of Labor Statistics, Treasury</i>				
Money supply (M1)		June	\$Bil.	1,063	1,063	1,116	–	-4.7
Consumer Price Index – NSA		June	1982-84=100	160.3	160.1	156.7	0.1	2.3
Producer Price Index <sup>1</sup>		June	1982=100	131.1	131.2	131.2	-0.1	-0.1
Prime rate charged by banks <sup>2</sup>		July	Pct.	8.50	8.50	8.25	–	3.0
3-month U.S. T-bill – NSA		July	Pct.	5.19	5.07	5.17	2.4	0.4
<b>Other Principal Indicators</b> .....				<i>Sources: Bureau of Labor Statistics, Bureau of Economic Analysis</i>				
Civilian labor force		July	Mil.	136.3	136.2	134.2	0.1	1.6
Unemployment rate		July	Rate	4.8	5.0	5.4	-4.0	-11.1
Index of leading indicators		June	1992=100	103.8	103.8	102.3	–	1.5
Personal income – AR		June	\$Bil.	6,866	6,824	6,512	0.6	5.4
				Qtr. 2	Qtr. 1	Percent		
				1997	1996	change <sup>3</sup>		
Chained (1992) dollars:								
Gross domestic product (GDP)			\$Bil.	7,140	7,102	2.2		
Personal consumption expenditures			\$Bil.	4,828	4,818	0.8		
Gross private domestic investment			\$Bil.	1,186	1,149	13.3		

– Represents zero. AR Annual rate. NSA Not seasonally adjusted. X Not applicable. <sup>1</sup>Finished goods. <sup>2</sup>As of end of month. <sup>3</sup>Annualized rate.  
 Note: Figures are seasonally adjusted except as noted. Unless otherwise noted, all amounts are in current dollars as of the reference year.

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## Auto Sales Totaled \$593 Billion in 1996

U.S. auto dealers and retail stores had sales of \$593 billion in 1996. Their best month? October, with sales of \$50.1 million (seasonally adjusted), followed closely by December and February.

Look for the big picture in retail in the Census Bureau's *Annual Benchmark Report for Retail Trade: January 1987 Through December 1996*, Series BR/96-RV, with monthly and annual data.

Source: <[www.census.gov/prod/2/bus/retail/br-96rv.pdf](http://www.census.gov/prod/2/bus/retail/br-96rv.pdf)> Print (\$5.50, call 301-457-4100).

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## America's Children at Risk

About half of America's 16- and 17-year-olds face risks such as poverty, welfare dependence or the absence of one or more parents that make them more likely to face adversity later in life.

According to a new Census Brief, *America's Children at Risk*, children in this age group are more likely to wind up out of school and out of work; girls are more likely to become teenage mothers.

Source: <[www.census.gov/prod/www/titles.html#cenbrief](http://www.census.gov/prod/www/titles.html#cenbrief)>. Print (free, 301-457-4100).

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## Foreign-Born Citizens As Likely to Own Homes As Native-Borns

Foreign-born citizens are about as likely to be homeowners as native-born Americans. About 67 percent in each case owned their own homes. About 33 percent of non-citizens owned theirs.

Census Bureau housing analyst Robert Callis said, "These data help demonstrate that immigrants who become permanent citizens have the same success in owning a home as native-born citizens."

Source: *Moving to America – Moving to Homeownership*, Series H121/97-2. <[www.census.gov/hhes/www/homeown.html](http://www.census.gov/hhes/www/homeown.html)>. Print (call 301-457-4100).

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