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Correctional Facility and Inmate Locations: Urban and Rural Status Patterns

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Abstract

As the incarcerated population grew from the 1980s through the late 2000s, so too did the number of correctional facilities. An increasing number of these facilities have been constructed in rural areas. While research has shown there has been growth in prisons and prisoners in rural areas, there are no recent national-level statistics regarding the urban-rural status of correctional facilities and inmates, the urban-rural status of inmates prior to prison, or an accounting of how many inmates from urban or rural areas are incarcerated in urban and rural facilities. Using 2010 decennial census and Bureau of Justice Statistics' 2004 Survey of Prison Inmates data we describe these patterns. We find that a disproportionate share of prisons and inmates are located in rural areas, while a disproportionate share of inmates are from urban areas. Our research could inform discussions about the potential consequences of Census Bureau residence criteria for inmates.

Keywords: Correctional Facilities, Inmates, Urban and Rural

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Introduction

The nearly five-fold increase in the size of the U.S. prison population since the 1980s occurred along with an increase in prison facility growth in rural areas. Prior to 1980, the majority of prisons were located in metropolitan areas (The Adler School and ICIRR 2011), as more than one-third of prisons were located in rural areas and small towns (Huling 2002). In the 1980s and 1990s, as the state and federal prison population increased from about 330,000 to 1.4 million persons (Carson and Anderson 2016), there was a substantial increase in the building of prisons in rural communities (Huling 2002). While research has demonstrated that there has been substantial *growth* in prisons and prisoners in rural areas (Beale 1996; Glasmeier and Farrigan 2007; Huling 2002; King et al. 2003), less is known about the urban vs. rural distribution of correctional facilities and inmates. Moreover, there are currently no national level statistics that document a) the proportion of inmates that are from urban and rural areas prior to incarceration and b) the extent to which prisoners who lived in urban or rural areas prior to incarceration are incarcerated in urban and rural areas.

We fill these research gaps using 2010 decennial census and Bureau of Justice Statistics' 2004 Survey of Prison Inmates (SPI) data. We answer the following research questions.

- 1) What percentage of correctional facilities and inmates are located in urban and rural areas?
- 2) What percentage of inmates are from urban and rural areas? and
- 3) What percentage of inmates who lived in an urban or rural area prior to incarceration go to a correctional facility in an urban or rural area?

Our research may inform discussions about the social and economic impact of the location of correctional facilities. We provide baseline results to better understand the

distribution of prisoners and prisons in rural and urban communities and the flow of inmates from urban and rural communities to correctional facilities in urban and rural areas.

Data and Methodology

We use 2010 decennial census group quarters data to answer research question 1, which focuses on the urban and rural status of correctional facilities and inmates. We use 2004 SPI data for research questions 2 and 3, which focus on where inmates live prior to prison and what type of facility they reside in during prison by urban and rural status. SPI includes a question about the zip code where inmates lived prior to incarceration, and a question about the zip code of the correctional facilities where the inmates reside, which allow us to compare inmates' urban and rural status prior to prison to their status while in prison. Note that decennial census group quarters data allows us to look at all types of correctional facilities, while the SPI analysis focuses on state and federal prisoners. We use descriptive statistics to answer our research questions.

The 2004 SPI interviewed about 14,500 state inmates and 3,700 federal inmates, drawing its sample from 1,585 state prisons and 148 federal prisons.² The SPI data do not include an urban/rural variable, but do include zip code identifiers for both correctional facilities and inmates' previous residence. We associate zip code identifiers with the Census Bureau's Urban Area to Zip Code Tabulation Area (ZCTA) relationship files to designate prisoners' previous residence and correctional facility zip codes as urban and rural.³ However, since not all observations in the SPI data have a zip code and not all zip codes are associated with a ZCTA,

² For more information about the 2004 SPI please see https://www.bjs.gov/content/pub/pdf/sisfcf04_q.pdf.

³ ZCTAs do not map to urban/rural designations in a one-to-one fashion. We assign urban/rural status to ZCTAs based on the largest fraction of the ZCTA population that lives in an urban vs. rural area. More information on the Urban/Rural relationship files can be found at <https://www.census.gov/geo/maps-data/data/relationship.html>

we do not have urban and rural information for all observations in the SPI data.⁴ Out of the 18,185 individuals in the SPI data, 13,910 inmates provide non-missing zip codes of pre-incarceration residence, and of these, we can assign urban and rural status for 12,995 inmates. We use two different definitions of urban areas in this assignment, the first of which is the official Census Bureau definition, and the second of which is a refinement of the Census definition that differentiates between small and large urban clusters.

Table 1 shows the number, percentage, and demographic characteristic distributions of the total SPI data, the observations with urban and rural information, and the observations with no urban and rural information. We use SPI sample weights to generate these summary statistics, and for subsequent analysis. We report estimated averages and weighted sums in the text. Standard errors for these estimates are provided in appendix tables. About 72 percent of all SPI observations can be assigned urban and rural information (column 4). We were able to assign urban and rural information for a high percentage of Black (76 percent) and White respondents (71 percent). The Other category has the lowest percentage of observations with urban and rural information (57 percent). A higher percentage of younger groups and females received urban and rural information compared to older groups and males. Examining the characteristic distributions (columns 6-8), we find that Blacks are slightly overrepresented in our universe of observations that have urban and rural identifiers, while Hispanics are slightly underrepresented. Older age

⁴ A zip code is a list of addresses or PO Boxes used by the U.S. Postal Service for mail delivery. Census defines ZCTAs for most zip codes. However, if a zip code consists of only PO Boxes (and hence does not correspond to a geographic area), Census does not define a ZCTA for this zip code (U.S. Census Bureau 2000).

Table 1 Number, Percentage, and Characteristic Distributions of Prisoners in 2004 Survey of Prison Inmates data, Total, With Urban and Rural Information and Without Urban and Rural Information

Group	SPI Total	With Urban and Rural Information	No Urban and Rural Information	% of SPI with Urban and Rural Information	% of SPI without Urban and Rural Information	Distribution of Characteristics of SPI data	Distribution of Characteristics of SPI data with Urban and Rural Information	Distribution of Characteristics of SPI data without Urban and Rural Information
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Total	18,185	12,995	5,190	71.5	28.5	-	-	-
Race								
AIAN	762	517	245	67.8	32.2	4.2	4.0	4.7
Asian	170	110	60	64.7	35.3	0.9	0.8	1.2
Black	7,314	5,563	1,751	76.1	23.9	40.2	42.8	33.7
Hispanic	3,427	2,201	1,226	64.2	35.8	18.8	16.9	23.6
Other	142	81	61	57.0	43.0	0.8	0.6	1.2
White	6,370	4,523	1,847	71.0	29.0	35.0	34.8	35.6
Age							0.0	0.0
Under 24	2,786	2,220	566	79.7	20.3	15.3	17.1	10.9
Age 25-29	3,033	2,306	727	76.0	24.0	16.7	17.7	14.0
Age 30-39	6,080	4,372	1,708	71.9	28.1	33.4	33.6	32.9
Age 40-49	4,379	2,943	1,436	67.2	32.8	24.1	22.6	27.7
Age 50+	1,907	1,154	753	60.5	39.5	10.5	8.9	14.5
Gender							0.0	0.0
Female	3,888	2,999	889	77.1	22.9	21.4	23.1	17.1
Male	14,297	9,996	4,301	69.9	30.1	78.6	76.9	82.9

Source: 2004 Survey of Prison Inmates

*AIAN = American Indian, Other = Pacific Islander, multiracial, and non-Hispanic Some Other Race

groups and males are slightly underrepresented in our universe, while younger age groups and females are slightly overrepresented.⁵

Results

We use 2010 decennial census data to answer research question 1. We use standard Census definitions of urban and rural areas for one set of estimates, and we present alternative definitions of urban and rural areas for a second set of estimates. The Census Bureau defines two types of urban areas: Urbanized Areas, with populations of 50,000 residents or more, and Urban Clusters, with populations of 2,500 to 49,999 residents. Rural areas encompass all communities not included in the urban area definitions.⁶ However, some areas that are defined as urban clusters would not be considered by most to be urban areas.^{7,8} To accommodate this heterogeneity within the Census urban cluster definition, we present a second set of estimates using alternative definitions of urban and rural. Under these alternative definitions, we define urban areas as either Urbanized Areas with 50,000 or more residents, or Large Urban Clusters defined as having 10,000 to 49,999 residents. We define our alternative rural areas as either Small Urban Clusters that have 2,500 to 9,999 residents or (Census-defined) rural areas.⁹

Using the Census Bureau definitions of urban and rural, we find that 69 percent of correctional facilities are in urban areas, while 31 percent are in rural areas (Table 2).¹⁰ Using our

⁵ To assess whether these patterns in the missingness of zipcode information might bias subsequent results, we estimated a probit model with age, race, and gender as explanatory variables, and then calculated reweighted proportions of prisoners from urban/rural areas. As these reweighted proportions are qualitatively similar to the results described below, we conclude that bias due to missingness is not a major concern.

⁶ See <https://www.census.gov/geo/reference/urban-rural.html> for more information.

⁷ See map http://www2.census.gov/geo/pdfs/maps-data/maps/thematic/2010ua/UA2010_UAs_and_UCs_Map.pdf.

⁸ Note that some urban clusters may exist as urban clusters and not rural areas because of the prison population and staff and services that support the prison.

⁹ This alternate definition aligns with France's definitions of urban and rural areas.

¹⁰ We identify prison facilities in the decennial Census by MAFID, which is a slightly different definition of a facility than BJS uses. Many individual prisons, in particular, have multiple buildings/subunits, and hence have multiple MAFIDs.

alternative definitions of urban and rural, we continue to find that a higher percentage of correctional facilities are located in urban areas (54 percent) compared to rural areas (46 percent). However, the percentage of prisons in urban areas decreases considerably when we use our alternative definitions of urban and rural compared to the Census definitions.

Using the Census definitions of urban and rural, we find that, although the majority of facilities across group quarters types are located in urban areas, there is substantial variation by type of facility. The percentage of correctional facilities in urban areas ranges from 61 percent for state prisons to 86 percent for correctional residential facilities. Using our alternative definitions, all group quarters types except for state prisons have the majority of their facilities in urban areas. There is substantial variation across facility type with our alternative definitions, with the percentage of facilities in urban areas ranging from 45 percent for state prisons to 83 percent for correctional residential facilities. All group quarters types have a lower proportion of facilities in urban areas when we use our alternative urban and rural definitions as compared to the census definitions.

We also find that a higher percentage of inmates are incarcerated in urban areas compared to rural areas, regardless of what urban and rural definitions we use: 73 percent when we use Census definitions and 60 percent when we use our alternative definitions. Similar to the correctional facility results, when using the Census definitions of urban and rural, we find that for all group quarter types the majority of inmates are located in urban areas—ranging from 63 percent for state prisons to 90 percent for local jails. The pattern we observe for correctional facilities using our alternative definitions holds for inmates as well, where the majority of inmates across all group quarter types except for state prisons (47 percent) are located in urban areas.

Table 2 Percentage of Correctional Facilities and Prisoners in Urban and Rural Areas by Group Quarters Type

Group Quarters Type	Correctional Facilities					Prisoners				
	Total Number	Census Definition		Alt. definition		Total Number	Census Definition		Alt. definition	
		% Urban	% Rural	% Urban	% Rural		% Urban	% Rural	% Urban	% Rural
Total	14,248	68.6	31.4	53.9	46.1	2,329,163	72.9	27.1	60.1	39.9
Correctional residential facilities	1,370	86.2	13.8	82.7	17.3	90,880	81.3	18.7	73.9	26.1
Federal detention centers	270	67.4	32.6	53.7	46.3	68,577	67.8	32.2	56.5	43.5
Federal prisons	546	75.6	24.4	56.2	43.8	172,020	77.3	22.7	58.9	41.1
Juvenile correctional facilities	2,027	66.5	33.5	61.0	39.0	65,687	71.2	28.8	65.7	34.3
Local jails	3,671	75.9	24.1	54.4	45.6	682,043	90.0	10.0	82.1	17.9
Military disciplinary barracks and jails	25	80.0	20.0	72.0	28.0	1,789	73.2	26.8	72.0	28.0
State prisons	6,339	60.7	39.3	44.8	55.2	1,248,167	62.6	37.4	47.2	52.8

Source: 2010 Census

It is noteworthy that when we use our alternative definitions of urban and rural, the majority of state prisons and prisoners are located in rural areas. State prisons and prisoners make up a large proportion of correctional facilities (44 percent) and the prison population (54 percent) and are often the focus of incarceration research.

We use 2004 SPI data to answer research question 2. We provide results using the Census Bureau definitions of urban and rural and our alternative definitions of urban and rural. Using the Census Bureau definitions of urban and rural, we find that the vast majority of inmates in our universe, 90 percent, lived in urban zip codes prior to incarceration and 10 percent lived in rural zip codes (Table 3). Using our alternative definition of urban and rural, the results are quite similar, with 87 percent of inmates having lived in urban zip codes prior to incarceration and 13 percent having lived in rural zip codes.¹¹ These patterns are similar for federal and state prisons.

Table 3 Number and Percent of Prisoners who Lived in an Urban or Rural Area Prior to Incarceration

	Total	Census Definitions				Alternative Definitions			
		Urban		Rural		Urban		Rural	
		N	%	N	%	N	%	N	%
Total	964,020	862,948	89.5	101,072	10.5	838,217	87.0	125,803	13.0
Federal Prisons	84,701	76,299	90.1	8,402	9.9	74,613	88.1	10,087	11.9
State Prisons	879,319	786,649	89.5	92,671	10.5	763,603	86.8	115,716	13.2

Source: 2004 Survey of Prison Inmates

We also use 2004 SPI data to answer research question 3. Using the Census Bureau definition of urban and rural, we find that 67 percent of inmates who lived in urban areas before

¹¹ It is possible that, due to non-random missingness of geographic identifiers for zip code of previous residence in the SPI, these numbers may be biased. However, although we do find some systematically varying missingness across demographic groups, reweighting by the inverse probability of missingness produces essentially identical statistics, suggesting that any bias is minimal. More detailed results are available on request.

incarceration were incarcerated in an urban prison while 33 percent were incarcerated in a rural prison (Table 4). A lower proportion of people who lived in rural areas prior to incarceration were incarcerated in prisons in urban areas (52 percent) compared to inmates who lived in urban areas prior to incarceration. Forty-eight percent of inmates who lived in rural areas were incarcerated in prisons in rural areas.

Table 4 Urban and Rural Status of the Previous Residence of Prisoners before Incarceration Compared to their Prison Location

Pre-incarceration Zip Code	Total	Incarceration Zip Code			
		Urban		Rural	
		N	%	N	%
Census Definitions					
		<u>Total</u>			
Urban	717,271	479,166	66.8	238,105	33.2
Rural	86,032	44,932	52.2	41,100	47.8
		<u>Federal Prisons</u>			
Urban	69,111	54,267	78.5	14,843	21.5
Rural	7,575	4,789	63.2	2,786	36.8
		<u>State Prisons</u>			
Urban	648,161	424,899	65.6	223,262	34.4
Rural	78,457	40,143	51.2	38,313	48.8
Alternative Definitions					
		<u>Total</u>			
Urban	695,981	352,145	50.6	343,836	49.4
Rural	107,322	42,661	39.8	64,660	60.2
		<u>Federal Prisons</u>			
Urban	67,594	38,513	57.0	29,081	43.0
Rural	9,091	4,747	52.2	4,344	47.8
		<u>State Prisons</u>			
Urban	628,387	313,632	49.9	314,755	50.1
Rural	98,231	37,914	38.6	60,317	61.4

Source: 2004 Survey of Prison Inmates

Using our alternative urban and rural definitions, the proportion of inmates who lived in an urban area prior to incarceration and were incarcerated in a prison in an urban area drops to 51 percent and 49 percent of those living in an urban area prior to incarceration were incarcerated in a prison located in a rural area. About 40 percent of inmates from rural areas were in a prison in an urban area and 60 percent were in a prison in a rural area.

There are substantial differences across state and federal prisons in the proportion of prisoners from urban areas who are incarcerated in rural areas—21 percent of prisoners from urban areas are incarcerated in rural federal prisons, while 37 percent are incarcerated in rural state prisons using Census definitions. These corresponding percentages are 43 and 50 percent using our alternate urban and rural definitions. This is consistent with Table 2, which shows that a higher proportion of federal prisons are in urban areas, compared to state prisons.

Conclusion

Our results indicate that the definition of urban and rural areas can lead to different conclusions about the urban and rural status of correctional facilities and inmates. If we use Census definitions, a majority of correctional facilities and inmates are located in urban areas, and a majority of inmates who come from urban areas reside in correctional facilities in urban areas. When we use alternative definitions, a majority of correctional facilities and inmates are still in urban areas, although the percentages are considerably lower than when we use Census definitions. Moreover, when we use the alternative definitions, a majority of state prisons and prisoners, which house the largest number of prisoners, are located in rural areas. Additionally, using alternative definitions, about 50 percent of prisoners who lived in urban areas prior to incarceration were incarcerated in a prison in a rural area. The vast majority of Americans live in urban areas (81 percent using the census definition and 77 percent using our alternative

definition).¹² Our results thus indicate that a disproportionate share of correctional facilities and inmates are located in rural areas, while a disproportionate share of prisoners are from urban areas.

¹² See <https://www.census.gov/library/visualizations/2016/comm/acs-rural-urban.html> for urban rural estimates using Census definitions. Alternative definition estimates are based on authors' calculations.

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Appendix: Additional Tables

Appendix Table 1: Standard Errors for Table 1, columns 4-8

Group	% of SPI with Urban and Rural Information	% of SPI without Urban and Rural Information	Distribution of Characteristics of SPI data	Distribution of Characteristics of SPI data with Urban and Rural Information	Distribution of Characteristics of SPI data without Urban and Rural Information
	(4)	(5)	(6)	(7)	(8)
Total	0.003	0.003	-	-	-
Race					
AIAN	0.006	0.006	0.001	0.002	0.003
Asian	0.005	0.005	0.001	0.001	0.001
Black	0.017	0.017	0.004	0.004	0.007
Hispanic	0.008	0.008	0.003	0.003	0.006
Other	0.036	0.036	0.001	0.001	0.001
White	0.041	0.041	0.004	0.004	0.007
Age					
Under 24	0.008	0.008	0.003	0.003	0.004
Age 25-29	0.008	0.008	0.003	0.003	0.005
Age 30-39	0.007	0.007	0.003	0.004	0.006
Age 40-49	0.006	0.006	0.003	0.004	0.006
Age 50+	0.011	0.011	0.002	0.002	0.005
Gender					
Female	0.004	0.004	0.002	0.002	0.003
Male	0.007	0.007	0.002	0.002	0.003

Source: 2004 Survey of Prison Inmates.

*AIAN = American Indian, Other includes people reported as Pacific Islander, multiracial, and non-Hispanic Some Other Race.

Appendix Table 2: Standard Errors for Table 3

	Census Definitions				Alternative Definitions			
	Urban		Rural		Urban		Rural	
	N	%	N	%	N	%	N	%
Total	34.923	0.003	34.923	0.003	38.400	0.003	38.400	0.003
Federal Prisons	14.693	0.006	14.693	0.006	15.920	0.007	15.920	0.007
State Prisons	31.582	0.003	31.582	0.003	34.770	0.003	34.770	0.003

Source: 2004 Survey of Prison Inmates

Appendix Table 3: Standard Errors for Table 4

Pre-incarceration Zip Code	Urban		Rural	
	N	%	N	%
Census Definitions				
	<u>Total</u>			
Urban	46.922	0.005	46.922	0.005
Rural	17.027	0.015	17.027	0.015
	<u>Federal Prisons</u>			
Urban	18.398	0.009	18.398	0.009
Rural	7.120	0.033	7.120	0.033
	<u>State Prisons</u>			
Urban	42.292	0.005	42.292	0.005
Rural	15.358	0.016	15.358	0.016
Alternative Definitions				
	<u>Total</u>			
Urban	49.088	0.005	49.088	0.005
Rural	18.635	0.013	18.635	0.013
	<u>Federal Prisons</u>			
Urban	21.931	0.011	21.931	0.011
Rural	8.101	0.031	8.101	0.031
	<u>State Prisons</u>			
Urban	43.812	0.006	43.812	0.006
Rural	16.772	0.014	16.772	0.014

Source: 2004 Survey of Prison Inmates