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**MEMORANDUM FOR THE RECORD**

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Subject: Documentation of the Imputation Methodology for the 2014 Juvenile Residential Facility Census

This memorandum documents the imputation methodology for the 2014 Juvenile Residential Facility Census (JRFC).

This document uses intentional white space to improve readability. This document is available as PDF to preserve the original formatting.

This document also serves as a guide to the programmer who works on the 2016 JRFC. Notes to the programmer are in brackets. The 2014 JRFC imputation system is reusable for the 2016 JRFC. [The programs are in the `\\govs009fs\smb\jrfc\2014` folder.]

The imputation methodology for the 2010 JRFC and earlier censuses used the section and question numbers as variable names. Starting with the 2014 JRFC, variables have new names, rather than using the section number and question number as the variable name. We needed to use prior year files for the 2014 JRFC imputation processing, so we updated the variable names on the prior year files to use the current naming convention. Please see the 2014 JRFC record layout for more details.

The Economic Directorate of the Census Bureau regularly conducts quality audits of survey and census programs. Some of the discussion in this document is based on feedback from the last JRFC quality audit. Some parts of the discussion may not be of interest to the sponsor but are required for the purposes of the quality audit.

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## Introduction

First conducted in 2000, the JRFC is a mail canvass census. The 2010 JRFC was the first collection to give facilities the option to respond online. Figure 1 shows the percentage distribution of response method for each year since 2010. Figure 2 shows the response method counts for each year since 2010. The online option is becoming more popular with facilities.

The JRFC asks juvenile residential custody facilities in the U.S. to describe their facilities. Adult facilities, or facilities exclusively for drug or mental health treatment, or facilities for abused or neglected children are not included in the census. The JRFC is conducted in even-numbered years. The reference date for the 2014 JRFC was October 22, 2014.

The Census of Juveniles in Residential Placement (CJRP) is conducted in alternate years and describes the characteristics of youth in custody. JRFC collects information about the facilities that hold juvenile offenders. The 2014 JRFC asks about facility characteristics such as size, structure, type, ownership, and security arrangements. JRFC also reports the number of juveniles who died in custody during the past twelve months. The 2014 JRFC also includes sections that ask about mental health services, educational services, and substance abuse services provided to the offenders.

The National Archive of Criminal Justice Data holds the previous data files, where they are part of a restricted-access collection. For more information, see <http://www.icpsr.umich.edu/icpsrweb/NACJD/>.

The project sponsor is the Office of Juvenile Justice and Delinquency Prevention (OJJDP). The Public Sector Statistical Methods Branch (PSSMB) of the Economic Statistical Methods Division is responsible for imputation in the JRFC, while the Criminal Justice Branch (CJB) in the Economic Reimbursable Surveys Division is responsible for the data collection and editing.

The 2014 questionnaire has seven sections:

- Section 1, which collects general facility information,
- Section 2, which collects information about mental health services,
- Section 3, which collects information about educational services,
- Section 4, which collects information about substance abuse services,
- Section 5, which collects information about the last month,
- Section 6, which collects information about the last year,
- Section 7, which collects general information.

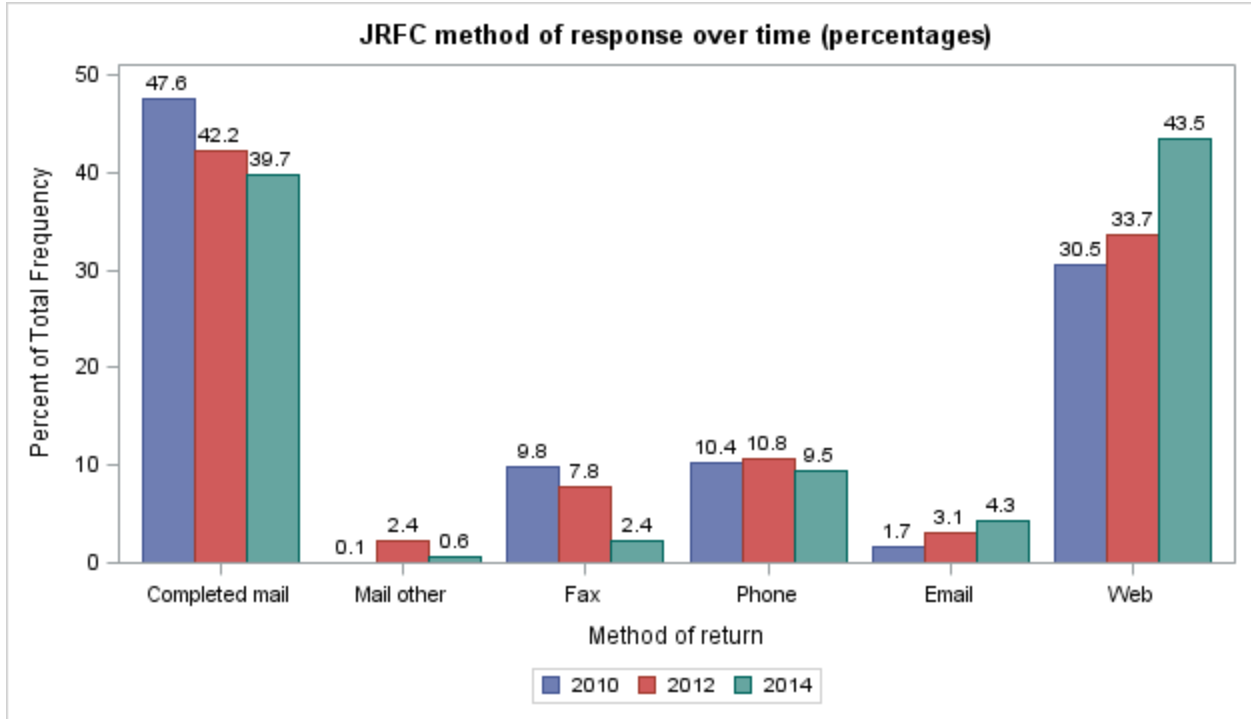


Figure 1. JRFC response method percentages over time

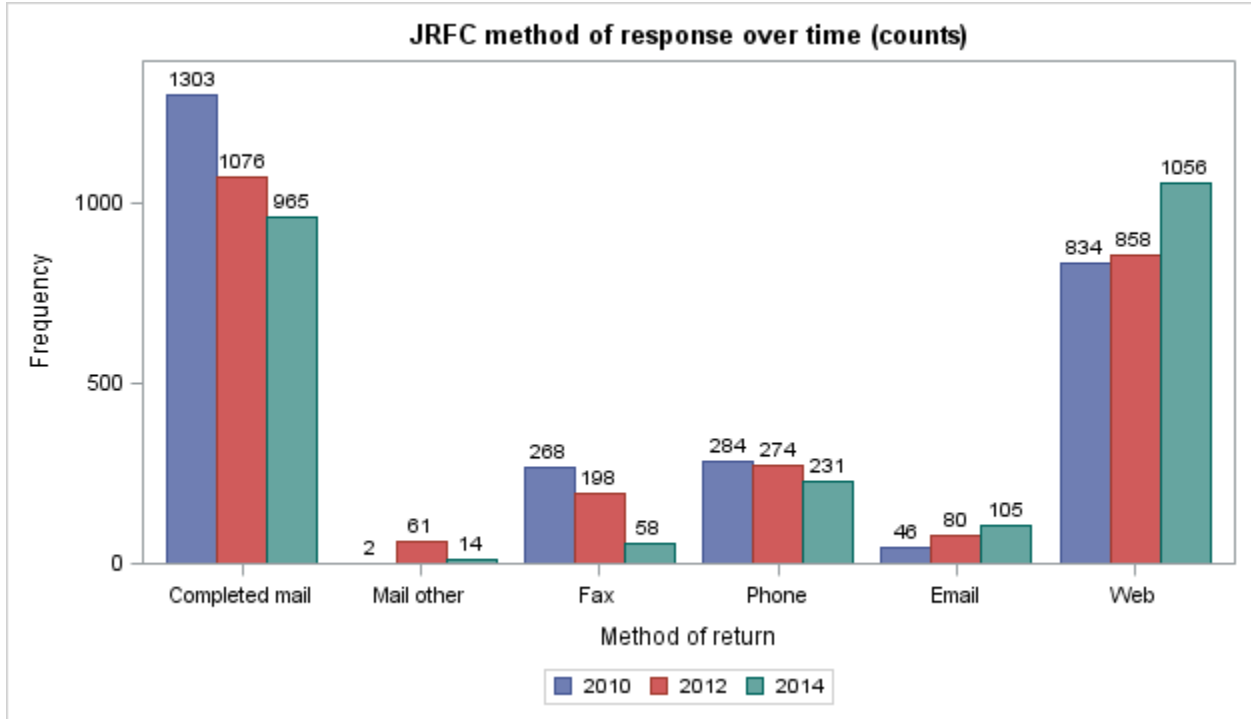


Figure 2. JRFC response method counts over time

## Definition of Out-of-scope Facility

A facility is temporarily out-of-scope when they do not hold juveniles on the reference date.

A facility is permanently out-of-scope for one of several reasons:

- The facility is no longer a residential facility (might have converted to day treatment only).
- The facility is a duplicate of a record already on the data file.
- The facility has changed from public to private, or private to public. When this happens, the facility ID changes, and the previous facility ID is out-of-scope.
- The facility no longer holds any juveniles (only handles adults).
- The facility no longer holds any offenders (juveniles are all voluntary placements, or in the facility because of neglect, abuse, dependency, or abandonment).

## Unit Response Rate

There were 2,223 in-scope facilities on reference day. 1,942 of the 2,223 facilities responded to the 2014 JRFC, for a unit response rate of 87.4 percent. 186 of the facilities refused to participate in the 2014 JRFC. We imputed records for the nontribal facilities in the 50 states and the District of Columbia that were refusals. There were five tribal refusal facilities and ten territorial refusal facilities. Each is on the 2014 JRFC imputed file, but only the facility ID, contact information, method of return, the check-in code, the status flag, and the occupied flag are available for those facilities. Other flags were set to 0 by default to be consistent with the Liger processing system.

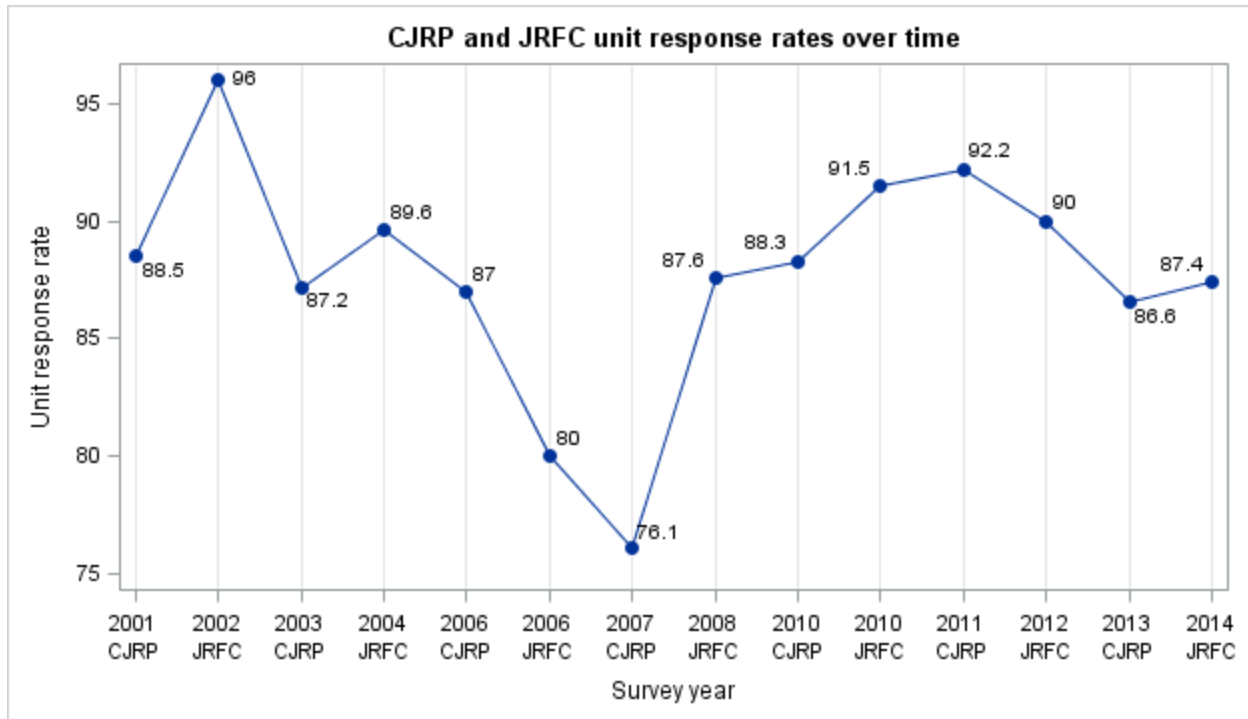
The unit response rate was calculated differently in previous years for both CJRP and JRFC. Previously reported unit response rates counted critical item facilities as respondents. The revised unit response rate is

$$\text{Unit response rate} = \frac{\text{Completed} + \text{Full Additions}}{\text{Completed} + \text{Full Additions} + \text{Refusals} + \text{Critical Items}}$$

based on the value of the CheckInStatus code for each facility.

Figure 3 shows the revised unit response rates for CJRP and JRFC over time.

The extraordinary number of critical item facilities in the 2006 CJRP (676) explains the 76.1 percent revised unit response rate for that year.



**Figure 3. CJRP and JRFC revised unit response rates over time**

[The program JRFC\_and\_CJRP\_unit\_response\_rates\_over\_time.sas calculates the revised unit response rates and generates the graphic display. The program online\_response\_rates\_over\_time.sas calculates the method of return values over time and generates the graphic displays.]

## Summary of Changes During 2014 Data Collection

There were quite a few changes for the 2014 JRFC:

- The 2014 JRFC was the first to use the Liger system for processing.
- JRFC variable names are more descriptive.
- The 2014 questionnaire includes three more sections.
- The way we impute occupied makeshift beds has changed.
- We have recalculated the CJRP and JRFC unit response rates where possible.

The 2010 JRFC and the 2012 JRFC were edited using the Harvester processing system. For 2014, the editing was migrated to the Liger system. The flags in the Liger system were unusable. Special processing had to be added to the imputation system to figure out which values in the file were really missing and thus needed to be imputed. The Liger system defaults *all* values to 0. Without accurate flags to indicate which values are missing, it can be difficult to distinguish between a reported value of 0 and a default value of 0 which indicates missing data. It is also worth noting that all variables on the

Liger export file are text. Counts need to be converted to numeric for calculations within the imputation system, and most other variables need to be converted to numeric to agree with the record layout.

The variable names for JRFC have changed completely from what they were in 2012. Since we use prior year files while imputing the current year JRFC, we had to recode the prior year files. The 2014 JRFC record layout includes columns for the 2013 CJRP, the 2012 JRFC, and the 2010 JRFC, with the original variable names on those files.

The mental health services section, the educational services section, and the substance abuse services section were not on the 2012 questionnaire. Those sections were on the 2010 questionnaire, but OJJDP decided that the four-year gap in collection was too large to pull existing data forward for item nonrespondents.

In the 2012 JRFC and earlier collections, we used a median value to impute occupied makeshift beds when it was missing. The problem is that very few facilities report occupied makeshift beds, so we end up imputing 0 values. The occupied makeshift beds question has a screener question just before it. We ask facilities first if they had any occupied makeshift beds on reference day. If the facility answers no, we direct them to skip over the number of occupied makeshift beds and on to the next question. The skip pattern implies that 0 should not be a valid answer for occupied makeshift beds. See the Data Quality Issues in Makeshift Beds Question section for more discussion.

The unit response rate reported previously for CJRP and JRFC data collections was calculated differently. We have recalculated the rates, where possible, as discussed in the Introduction section of this document. See Figure 3 for more details.



## Summary of the File

**Table 1. Summary of the facilities on the 2014 imputed file**

206	facilities permanently closed, temporarily closed, or out-of-scope
87	facilities that hold offenders and reported only critical items
7	facilities that hold nonoffenders only and reported only critical items
297	facilities that hold nonoffenders only and reported more than critical items
36	nontribal facilities in the 50 states or DC that hold nonoffenders only and were refusals
1,644	facilities that hold offenders and reported more than critical items
135	nontribal facilities in the 50 states or DC that hold offenders and were refusals
5	tribal facility refusals
10	territory facility refusals
2	facilities that either held no people or held no juveniles on reference day
<hr/> 2,429	facilities in the 2014 imputed file

**Table 2. 2014 JRFC counts (nontribal facilities in the 50 states and the District of Columbia that held juveniles on reference day)**

63,063	people in residential placement
333	adults
62,730	juveniles
50,821	juvenile offenders
11,909	juvenile nonoffenders
2,191	nontribal facilities in the 50 states and District of Columbia that held juveniles on reference day

[The program summarize\_JRFC\_imputed\_file.sas produces the counts in this section.]

## Records Eligible for Imputation

In the previous version of JRFC, we imputed missing data for all facilities. Starting with the 2010 JRFC, OJJDP requested that we not impute missing data for tribal facilities. The 2010 JRFC was the first cycle to attempt to collect data from facilities in American Samoa, Guam, Northern Marianas Islands, Puerto Rico, and the Virgin Islands. OJJDP and Census agreed that we would not impute missing data for the territorial facilities.

Tribal facilities face special challenges; that is one reason that we do not impute them. The reader is directed to *“From Broken Homes to a Broken System”*, written by Sari Horwitz and published in the Washington Post on November 28, 2014, and accessible online at <http://www.washingtonpost.com/sf/national/2014/11/28/from-broken-homes-to-a-broken-system/>.

Starting with the 2012 JRFC, we include the out-of-scope facilities, the temporarily closed facilities, and the permanently closed facilities on the final file, even though those records are not eligible for imputation. Researchers want to examine juvenile residential facilities over time, so we now include the out-of-scope facilities, the temporarily closed facilities, and the permanently closed facilities so that all facilities can be easily tracked over time.

There are two flags on the 2014 file that help quickly classify records as eligible for imputation or not. The `status_flag_2014` describes who operates the facility. The `occupied_flag_2014` indicates whether the facility held juveniles on reference day. Table 3 explains the status flag, while Table 4 explains the occupied flag. The first two digits of the facility ID indicate the state where the facility is located. Note that since we do not impute missing data for tribal or territorial facilities, the occupied flag is set to 0 when the tribal or territorial facility does not answer the questions about persons assigned to beds and juveniles assigned to beds on reference day.

**Table 3. Values of the status flag for the 2014 JRFC**

<b>Status_flag_2014 value</b>	<b>Description</b>	<b>How constructed</b>
1	State-operated public facilities in the 50 states and the District of Columbia	3 <sup>rd</sup> digit of ID = 0
2	Locally-operated public facilities in the 50 states and the District of Columbia	3 <sup>rd</sup> digit of ID is 1, 2, 3, or 4
3	Private facilities in the 50 states and the District of Columbia	3 <sup>rd</sup> digit of ID = 8
4	Tribal facilities (missing data are not imputed)	3 <sup>rd</sup> digit of ID = 7
5	Territorial facilities (missing data are not imputed)	Based on state code

**Table 4. Values of the occupied flag for the 2014 JRFC**

<b>Occupied_flag_2014 value</b>	<b>Description</b>	<b>How constructed</b>
0	Facility had no persons assigned to beds or had no juveniles assigned to beds on reference day	G_ASS_BDS is missing or set to 2, G_UNDER_21 is missing or set to 2
1	Facility had juveniles assigned to beds on reference day	G_NUM_UND_21 greater than 0

## Critical Item Facilities

In follow-up interviewing, CJB attempted to collect as much data as possible to fill in the seven sections of the questionnaire. The following data items were critical:

### Section 1:

- Question 5a and 5b (total persons assigned to beds in the facility)
- Question 6 (number of persons age 21 or over assigned to beds in the facility)
- Question 7a and 7b (number of persons under age 21 assigned to beds in the facility)
- Questions 8a and 8b (number of offenders under age 21 assigned to beds in the facility)
- Questions 9a and 9b (number of nonoffenders under age 21 assigned to beds in the facility)
- Question 13 (type of facility)
- Question 17a (who operates facility: private non-profit agency, for profit agency, or government agency)
- Question 22 (total number of standard beds in facility)
- Question 23a and 23b (occupied makeshift beds in the facility)

### Section 5:

- Question 2a (any juvenile transported to hospital emergency room during September?)
- Question 2b (reason why juvenile transported to hospital emergency room)

### Section 6:

- Question 1 (any juveniles die while assigned bed at facility within last 12 months?)
- Question 2 (how many juveniles died while assigned bed at facility within the last 12 months)
- Question 3 (cause of death, location, age, sex, race, date of admission, date of death)

The value of CheckInStatus indicates which facilities are critical item facilities. See Table 5 for more details.

**Table 5. Value for CheckInStatus code**

CheckInStatus value	Meaning
1	Respondent
2	Permanently closed
3	Temporarily closed
4	Out-of-scope
5	Refusal
6	Add in (new facility) full form
7	Add in (new facility) critical item
9	Critical item

## Item Response Rates

We calculated the item response rates for the 2014 JRFC by looking at the item values before imputation. There were 2,191 nontribal facilities in the 50 states and the District of Columbia that held juveniles on reference day. The calculations consider the skip patterns. If a facility was skipped out of a question on the form, they were not counted as an item nonrespondent. For example, if the facility answered No to the question asking if they held juveniles on reference day for reasons other than offenses (G\_ASS\_NONOFDRS), they were not considered an item nonrespondent for G\_NUM\_ASS\_NONOFDRS because they were instructed to skip G\_NUM\_ASS\_NONOFDRS.

Table 6 shows the item response rates for both the 2012 JRFC and the 2014 JRFC. Figure 4 shows the response rates in a graphic. Note that the item response rates were higher in 2012 except for the very first question on the form. In Table 6, — means that question was not on the questionnaire that year.

**Table 6. JRFC Item Response Rates by Year**

Description	2012 response rate	2014 response rate
S1-Question 1-Address Correct?	87.9	88.1
S1-Question 2-Physical Layout of Facility	90.4	88.3
S1-Question 3-Other bldgs w/units-beds?	90.4	88.3
S1-Question 4-Any detention overflow?	90.4	88.4
S1-Question 5a-Any persons assigned beds?	94.9	92.2
S1-Question 5b-Number assigned beds	94.8	92.2
S1-Question 6-Number assigned beds >21 yrs	94.8	92.2
S1-Question 7a-Any persons under 21 yrs?	94.8	92.2
S1-Question 7b-Number assigned <21	94.8	92.2
S1-Question 8a-Any assigned for offense?	94.8	92.1
S1-Question 8b-Number assigned for offense	94.8	92.1
S1-Question 9a-Any assigned for non-offense?	94.8	92.2
S1-Question 9b-Number assigned for non-offense	94.8	92.2
S1-Question 10a-On site residential treatment?	90.4	88.0
S1-Question 10b-Type of Residential Treatment	90.4	88.0
S1-Question 11-Provide foster care?	90.4	88.0
S1-Question 12-Provide independent living?	90.4	88.0
S1-Question 13-Type of facility	94.9	91.4
S1-Question 14a-Separate housing units?	90.4	88.1

<b>Description</b>	<b>2012 response rate</b>	<b>2014 response rate</b>
S1-Question 14b-Separate housing units differ	90.2	88.1
S1-Question 14c-Purpose of separate housing	89.9	88.1
S1-Question 14d-Do separate units share	90.4	88.1
S1-Question 15a-Is facility owned by	90.4	89.8
S1-Question 15b-Name of private agency	90.4	89.8
S1-Question 16-Level of government agency	90.4	89.8
S1-Question 17a-Is facility operated by	94.9	91.0
S1-Question 17b-Name of private agency	92.6	91.0
S1-Question 18-Level of Government agency	94.2	91.0
S1-Question 19a-Any persons locked in rooms?	90.4	88.2
S1-Question 19b-When locked in rooms	90.4	88.2
S1-Question 20-Features intended to confine	90.4	88.0
S1-Question 21a-Are outside doors locked?	90.4	88.2
S1-Question 21b-Why are outside doors locked	90.4	88.2
S1-Question 21c-When are outside doors locked	90.4	88.2
S1-Question 22-Total number standard beds	94.9	92.2
S1-Question 23a-Any occupied makeshift beds	94.8	90.1
S1-Question 23b-How many makeshift beds occupied	94.8	90.1
S1-Question 24-Number of Actual Occupants per Room	90.4	88.0
S1-Question 25.-Voluntary Large Muscle Activity?	90.4	88.0
S1-Question 26a.-Required Large Muscle Activity?	90.4	88.0
S1-Question 26b-Required Minutes Per Day	90.4	88.0
S1-Question 26c.-Required Days Per Week	90.4	88.0
S2-Question 1a-Risk of Suicide	-	88.0
S2-Question 1b-What best describes the process	-	88.0
S2-Question 2-Who asks questions	-	88.0
S2-Question 3-When are young persons first asked questions	-	88.0
S2-Question 4-Which young persons are asked questions	-	88.0
S2-Question 5a-Are any young persons re-asked questions	-	88.0
S2-Question 5b-Which best describes reason for re-asking	-	88.0

<b>Description</b>	<b>2012 response rate</b>	<b>2014 response rate</b>
S2-Question 6-Does facility assign different levels of risk to young persons	-	88.0
S2-Question 7a-Are at risk young persons placed in observation room	-	88.0
S2-Question 7b-What happens in observation room	-	88.0
S2-Question 8-Preventive measures	-	87.8
S2-Question 9-Any other mental health services Inside/outside:Yes, both available	-	88.0
S2-Question 10a-Is ongoing counseling provided	-	88.0
S2-Question 10b-Which forms of ongoing counseling	-	88.0
S2-Question 11-Are any young persons evaluated by a professional	-	88.0
S2-Question 12-When are young persons evaluated by a professional	-	87.5
S2-Question 13-Which young persons are evaluated	-	87.7
S2-Question 14a-Ongoing therapy for mental health provided	-	87.9
S2-Question 14b-Which forms of ongoing therapy are provided	-	87.9
S2-Question 14c-Which best describes the facility policy on mental health	-	87.9
S2-Question 15-Do medical professionals prescribe medication	-	88.0
S2-Question 16a-Are there one or more special living/sleeping units in the facility reserved for mental health	-	88.0
S2-Question 16b-How do these living/sleeping units differ	-	88.0
S2-Question 17a-Is there a specialized sex offender treatment program	-	88.0
S2-Question 17b-Are any provided to young persons charged with or adjudicated for a sex offense	-	88.0
S2-Question 18-Are there one or more special living/sleeping units for sex offenders	-	88.0
S2-Question 19a-Are information regarding their mental health status, services and or needs communicated to new residence or placement	-	88.0
S2-Question 19b-For which is this information shared	-	88.0
S3-Question 1-After arrival are any young persons evaluated to determine grade level	-	87.9
S3-Question 2-When are young persons evaluated for grade level:	-	87.9
S3-Question 3-Methods of evaluation of grade level	-	87.5
S3-Question 4-Which young persons are evaluated to determine grade level	-	87.5
S3-Question 5-As part of the discharge process, are any young persons evaluated to determine their educational grade levels and educational needs	-	87.9

<b>Description</b>	<b>2012 response rate</b>	<b>2014 response rate</b>
S3-Question 6-Which young persons are evaluated to determine grade level and educational needs when being discharged	-	87.9
S3-Question 7a-Do any young persons receive teacher instructions at a location either inside or outside this facility	-	87.9
S3-Question 7b-Which young persons attend school or receive teacher instructions	-	87.9
S3-Question 8-Which of the following educational services are provided	-	87.9
S3-Question 9a.i-How many hours a week do young persons attend school or receive teacher instruction	-	87.9
S3-Question 9a.o-How many hours a week do young persons attend school or receive teacher instruction	-	87.9
S3-Question 9b.i-How many months per year do young persons attend school or receive teacher instruction	-	87.9
S3-Question 9b.o-How many months per year do young persons attend school or receive teacher instruction	-	87.9
S3-Question 10a-Upon departure, is information regarding their educational status, services and/or needs communicated to young person's new placement	-	87.9
S3-Question 10b-For which young persons is this information shared	-	87.9
S4-Question 1a-After arrival, are any young persons evaluated to determine if they have substance abuse problems	-	88.0
S4-Question 1b-Which methods are used to evaluate persons substance abuse problems	-	88.0
S4-Question 2-When are young persons first evaluated to determine substance abuse problems	-	88.0
S4-Question 3a-Are all young persons evaluated after arrival in this facility to determine whether they have substance abuse problems	-	88.0
S4-Question 3b-Which young persons are evaluated for substance abuse problems	-	88.0
S4-Question 4a-Are any young persons required to provide urine samples	-	88.0
S4-Question 4b-Which best describes the circumstances under which urine samples are provided	-	88.0
S4-Question 5-Do any young persons receive substance abuse services inside or outside this facility	-	88.0
S4-Question 6-Which of the following substance abuse services are provided	-	88.0
S4-Question 7-Which of the following self-led, self help groups are provided	-	87.9
S4-Question 8a-Is ongoing counseling for substance abuse provided	-	87.9

<b>Description</b>	<b>2012 response rate</b>	<b>2014 response rate</b>
S4-Question 8b-Which forms of ongoing counseling for substance abuse are provided inside or outside facility	-	87.9
S4-Question 9a-Is ongoing therapy for substance abuse problems provided to young persons	-	88.0
S4-Question 9b-Which forms of ongoing therapy for substance abuse problems are provided	-	88.0
S4-Question 9c-Which best describes the facility policy on providing ongoing therapy for substance abuse problems	-	88.0
S4-Question 10a-Upon departure, is information regarding their substance abuse status, services and/or needs communicated with new placement	-	87.6
S4-Question 10b-For which young persons is this information shared	-	87.6
S5-Question 1-Any unauthorized departures?	89.9	88.1
S5-Question 2a-Any transported to hospital?	94.5	90.1
S5-Question 2b-Reason transported to hospital	94.5	90.1
S5-Question 3-Any restrained with mechanical device?	90.2	87.8
S5-Question 4-Any locked more than 4 hrs alone?	90.1	87.9
S5-Question 5a-Physical Health unavailable?	90.2	88.0
S5-Question 5b-Reasons Physical Health unavailable	90.2	88.0
S5-Question 6a-Mental Health unavailable?	90.1	87.9
S5-Question 6b-Reasons Mental Health unavailable	90.1	87.9
S5-Question 7a-Educational Instructions unavailable?	90.2	87.9
S5-Question 7b-Reasons Educational instructions unavailable	90.2	87.9
S5-Question 8a-Sub. Abuse services unavailable?	90.2	88.0
S5-Question 8b-Substance abuse services unavailable	90.2	88.0
S6-Question 1-Any persons die while assigned beds inside or outside this facility from 10/01/2013 and 09/30/2014	94.9	90.5
S6-Question 2-How many persons died?	94.9	90.3
S6-Question 3a- Cause of death-person 1	94.9	90.3
S6-Question 3b-Location of Death of person 1	94.9	90.3
S6-Question 3C-Age at death (years) of person 1	94.9	90.3
S6-Question 3D-Sex of person 1	94.9	90.3
S6-Question 3E-Race of person 1	94.9	90.3
S6-Question 3f-Date of admission-MONTH (person 1)	94.8	90.3



<b>Description</b>	<b>2012 response rate</b>	<b>2014 response rate</b>
S6-Question 3f-Date of admission-DAY (person 1)	94.8	90.3
S6-Question 3f-Date of admission-YEAR (person 1)	94.8	90.3
S6-Question 3g-Date of Death-MONTH	94.9	90.3
S6-Question 3g-Date of Death-DAY	94.9	90.3
S6-Question 3g-Date of Death-YEAR	94.9	90.3
S6-Question 3a-Cause of Death-person 2	94.9	90.3
S6-Question 3b-Location of Death-(Person 2)	94.9	90.3
S6-Question 3c-Age at Death- (person 2)	94.9	90.3
S6-Question 3d-Sex-(person 2)	94.9	90.3
S6-Question 3e-Race-(person 2)	94.9	90.3
S6-Question 3f-Date of admission-MONTH - (person 2)	94.9	90.3
S6-Question 3f-Date of admission-DAY - (person 2)	94.9	90.3
S6-Question 3f-Date of admission-YEAR - (person 2)	94.9	90.3
S6-Question 3g-Date of Death-MONTH (person 2)	94.9	90.3
S6-Question 3g-Date of Death-DAY (person 2)	94.9	90.3
S6-Question 3g-Date of Death-YEAR (person 2)	94.9	90.3
S6-Question 3a-Cause of Death- (person 3)	94.9	90.3
S6- Question 3b-Location of Death-(person 3)	94.9	90.3
S6-Question 3c-Age at Death-(person 3)	94.9	90.3
S6-question 3d-Sex- (person 3)	94.9	90.3
S6-question 3e-Race-(person 3)	94.9	90.3
S6-Question 3f-Date of admission-MONTH- (person 3)	94.9	90.3
S6-Question 3f-Date of admission-DAY- (person 3)	94.9	90.3
S6-Question 3f-Date of admission-YEAR- (person 3)	94.9	90.3
S6-Question 3g-Date of Death-MONTH- (person 3)	94.9	90.3
S6-Question 3g-Date of Death-DAY- (person 3)	94.9	90.3
S6-Question 3g-Date of Death-YEAR- (person 3)	94.9	90.3
S7-Question 1a-Other juvenile facilities in same bldg.?	90.5	88.0
S7-Question 1b-How many other juvenile facilities	90.5	88.0
S7-Question 2-Shares the following with reported facility	90.5	88.0

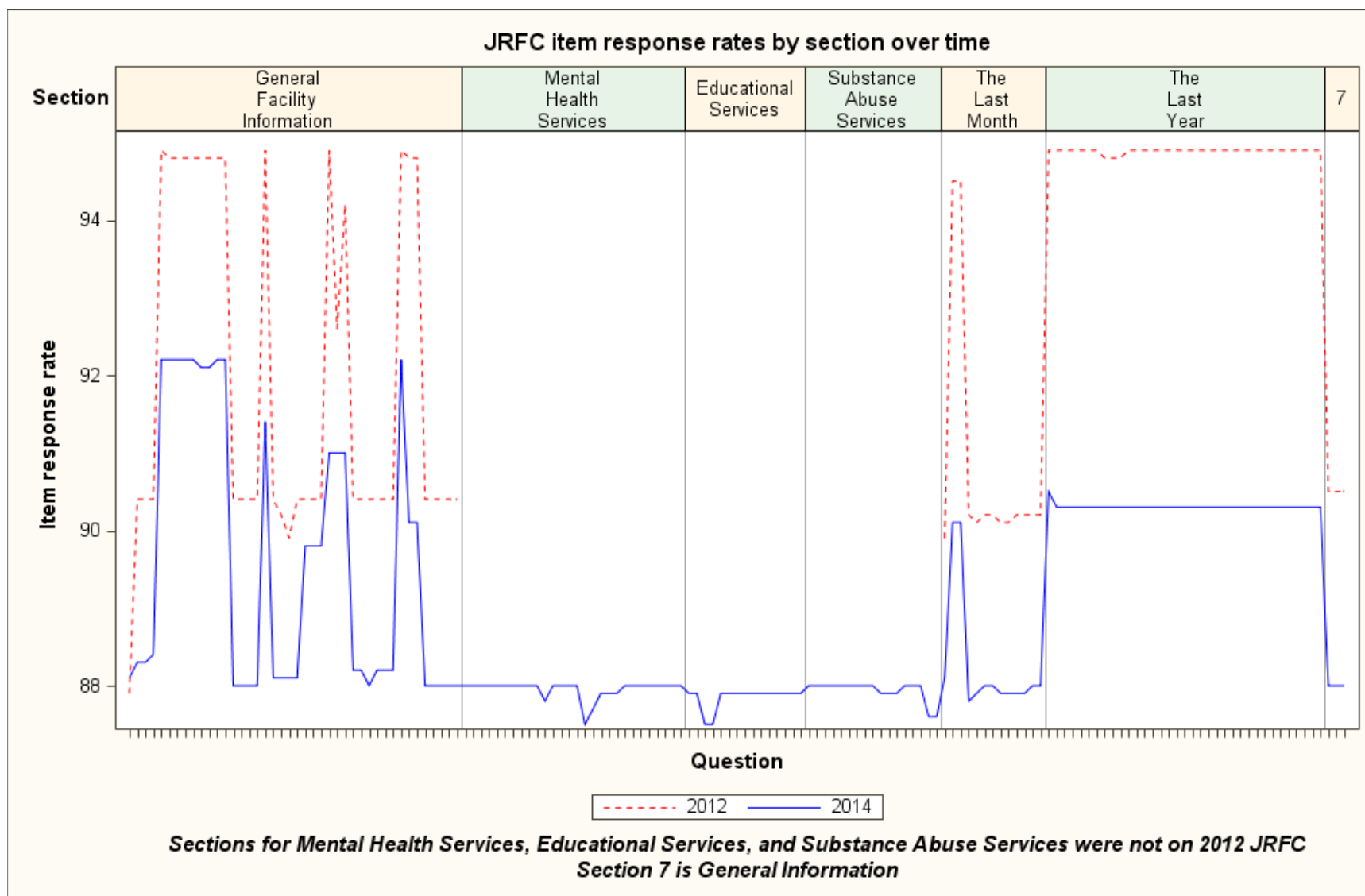


Figure 4. JRFC item response rates by section over time

## Questionnaire Items Eligible for Imputation

The following items were eligible for imputation in the 2014 JRFC. See the notes at the end of Table 7 for descriptions of the codes in the imputation method column.

**Table 7. Items eligible for imputation**

Question	Concept	Imputation method
G_PHY_LAYOUT, G_PHY_LAYOUT_SP	Physical layout of facility	A
G_OTH_BLDGS	Other buildings?	A
G_DET_OFLOW	House overflow population?	A
G_NUM_ASS_BDS	Persons assigned to beds	B (flag=2)
G_NUM_21_OLDER	Adults assigned to beds	B (flag=2) C (flag=21) D (flag=22) E (flag=23)
G_NUM_UND_21	Juveniles assigned to beds	B (flag=2)
G_NUM_ASS_OFDRS	Juvenile offenders assigned to beds	C (flag=21) D (flag=22) E (flag=23)
G_NUM_ASS_NONOFDRS	Juvenile nonoffenders assigned to beds	C (flag=21) D (flag=22) E (flag=23)
G_TYP_MNTL_HLTH through G_TYP_OTH_SP	On-site residential treatment?	A
G_FOSTER_CARE	Provide foster care?	A
G_INDEPENDENT_LIVING	Independent living?	A
G_FAC_DET_N_CTR through G_FAC_OTH_SP	Facility type	<b>See Collapsed Facility Type Codes section</b>
G_SEP_HOUSING through G_SEP_N1_OF_THE_ABV	Separate sleeping units?	A
G_FAC_OWND_PRVT through G_FAC_OWND_NAME	Facility ownership	A
G_FAC_LVL_NATIVE_AMER through G_FAC_LVL_OTH_SP	Level of government that owns facility	A
G_FAC_OPRTD_PRVT through G_FAC_OPRTD_NAME	Who operates facility	A
G_FAC_OPRTD_NATIVE_AMER through G_FAC_OPRTD_OTH_SP	Level of government that operates facility	A
G_LCKD_RMS through G_WHEN_OTH_SP	Juveniles locked in rooms?	A
G_CNF_SECURE_RMS through G_CNF_N1_OF_THE_ABV	Confine juveniles in specific areas?	A
G_OUT_DRS_LCKD through G_OUT_DRS_OTH_SP	Outside doors locked?	A
G_STAN_BDS	Number of standard beds	F (flag=20) B (flag=2)
G_MKSHFT_BDS_TOT	Occupied makeshift beds	F (flag=20) E (flag=23)

Question	Concept	Imputation method
G_NUM_1_PERSN through G_NUM_25_PLS	Sleeping room arrangements	F (flag=20) G (flag=24)
G_LG_MUSCLE_ACT	Voluntary large muscle activity	F (flag=20) E (flag=23)
G_REQ_LG_MUSCLE	Required large muscle activity	F (flag=20) H (flag=30)
G_REQ_MINUTES	Minutes per day of required large muscle activity	F (flag=20) G (flag=24) B (flag=2)
G_REQ_DYS_PER_WK	Days per week of required large muscle activity	F (flag=20) G (flag=24) B (flag=2)

**NOTES:** A means pulled forward from prior year if missing; if no prior year available, set to refusal.  
 B means derived from response to other variables (flag=2)  
 C means imputed using growth rate applied to prior year CJRP data (flag=21)  
 D means imputed using growth rate applied to prior year JRFC data (flag=22)  
 E means imputed using median value (flag=23)  
 F means pulled forward data from prior year JRFC (flag=20)  
 G means imputed using most commonly reported answer (flag=24)  
 H means randomly assigned based on reported rates (flag=30)

## Imputation Rates

Table 8 shows the item response rates and the total quantity response rates for 2012 and 2014.

The item response rate is

$$\frac{\text{Number of facilities with reported data for item}}{\text{Number of facilities eligible for imputation in JRFC data file}} \times 100.$$

The item imputation rate is 100 – the item response rate. For the 2014 JRFC, the item imputation rate is 7.8 percent for all key items except for makeshift beds, which has an item imputation rate of 9.9 percent.

The total quantity response rate shows how much of the quantity estimate was reported. The total quantity response rate is

$$\frac{\text{Estimate using only data reported by facilities}}{\text{Estimate using both reported and imputed data}} \times 100.$$

Table 8 shows that we did not impute any adults assigned to beds. This is not surprising, given how few facilities reported adults assigned to beds in the 2014 JRFC.

Figure 5 shows that the key item response rates were higher in 2012 than 2014. Figure 6 shows the same pattern for the total quantity response rate.

[The program JRFC\_response\_rates\_over\_time.sas calculates the item response rates and the total quantity response rates and produces the graphic displays.]

**Table 8. JRFC item response rates and total quantity response rates over time**

Variable	2012 JRFC							
	Reported Records	Imputed Records	Total Facilities	Item Response Rate	Reported Count	Imputed Count	Quantity Estimate	Total Quantity Response Rate
S1-Question 5b-Number assigned beds	2,216	121	2,337	94.8	67,253	2,559	69,812	96.3
S1-Question 6-Number assigned beds >21 yrs	2,216	121	2,337	94.8	196	0	196	100.0
S1-Question 7b-Number assigned <21	2,215	122	2,337	94.8	67,001	2,615	69,616	96.2
S1-Question 8b-Number assigned for offense	2,216	121	2,337	94.8	55,747	1,443	57,190	97.5
S1-Question 9b-Number assigned for non-offense	2,216	121	2,337	94.8	11,310	1,116	12,426	91.0
S1-Question 22-Total number standard beds	2,217	120	2,337	94.9	97,168	3,331	100,499	96.7
S1-Question 23b-How many makeshift beds occupied	2,216	121	2,337	94.8	82	0	82	100.0
Variable	2014 JRFC							
	Reported Records	Imputed Records	Total Facilities	Item Response Rate	Reported Count	Imputed Count	Quantity Estimate	Total Quantity Response Rate
S1-Question 5b-Number assigned beds	2,020	171	2,191	92.2	59,281	3,782	63,063	94.0
S1-Question 6-Number assigned beds >21 yrs	2,020	171	2,191	92.2	333	0	333	100.0
S1-Question 7b-Number assigned <21	2,020	171	2,191	92.2	58,948	3,782	62,730	94.0
S1-Question 8b-Number assigned for offense	2,020	171	2,191	92.2	48,324	2,497	50,821	95.1
S1-Question 9b-Number assigned for non-offense	2,020	171	2,191	92.2	10,624	1,285	11,909	89.2
S1-Question 22-Total number standard beds	2,020	171	2,191	92.2	88,676	4,772	93,448	94.9
S1-Question 23b-How many makeshift beds occupied	1,974	217	2,191	90.1	82	65	147	55.8

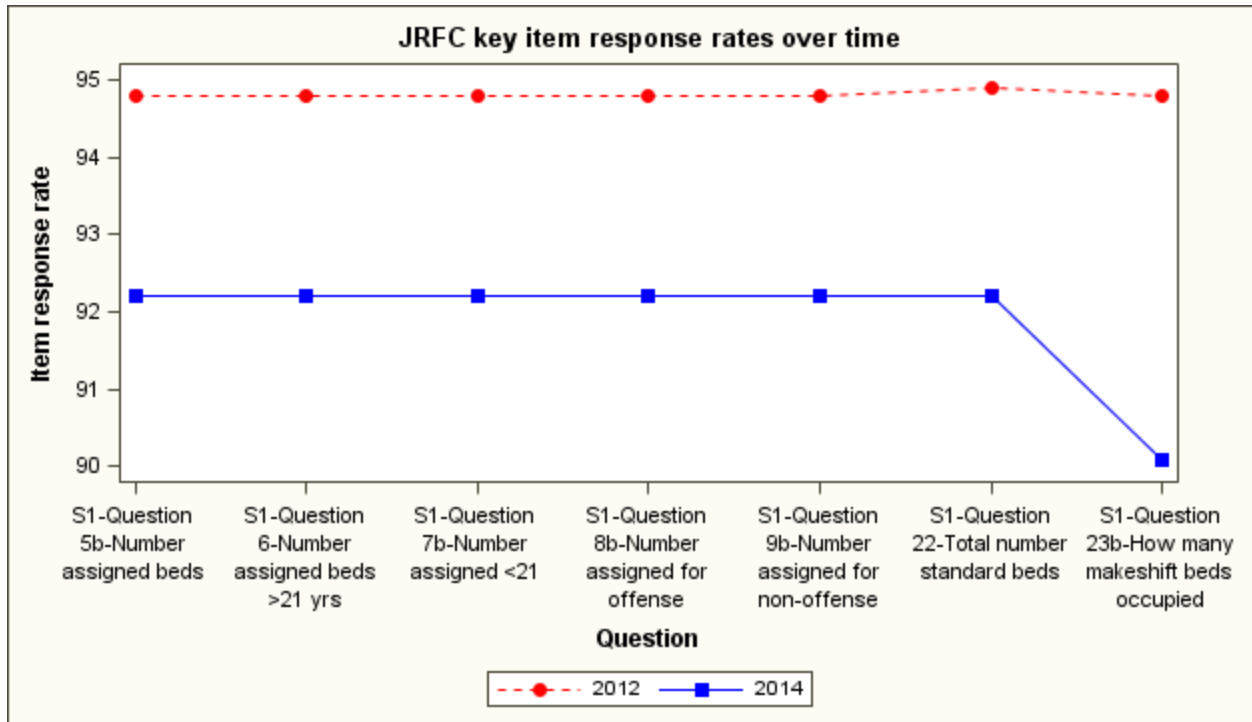


Figure 5. JRFC key item response rates over time

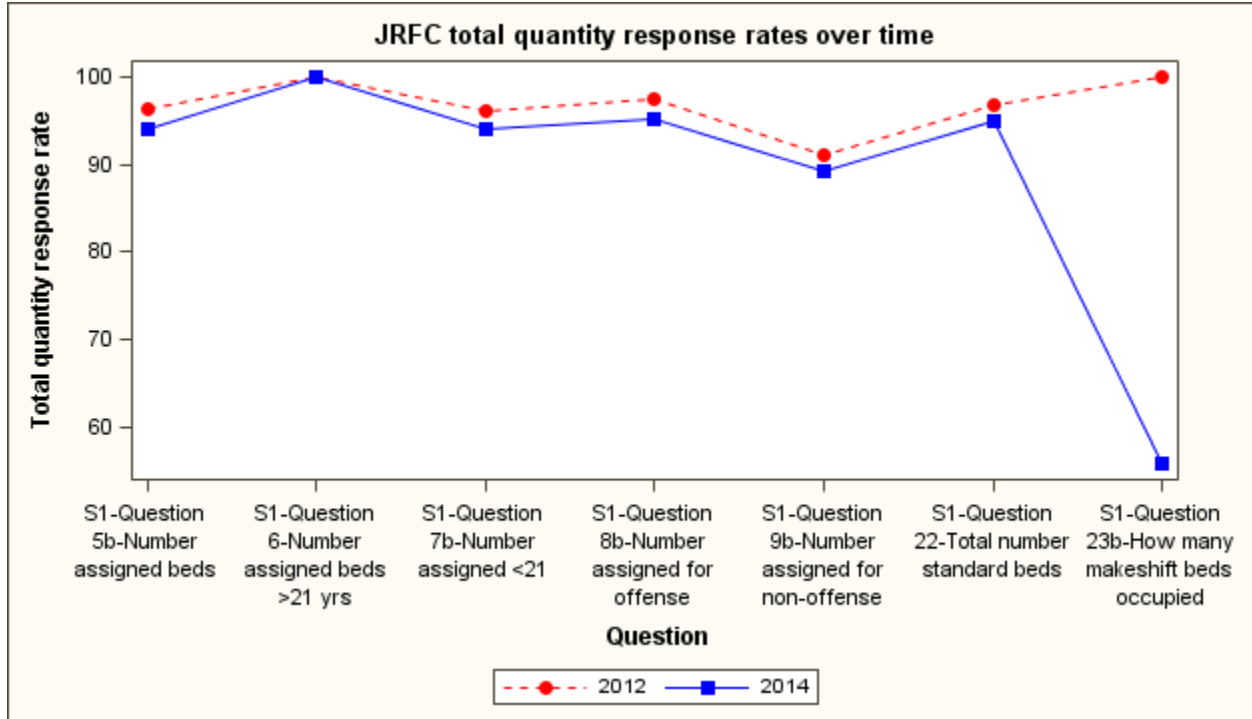


Figure 6. JRFC total quantity response rates over time

## Collapsed Facility Type Codes

For imputation purposes, we assign a collapsed facility type code (COLLAPSED\_FACILITY) to every facility. We only assign COLLAPSED\_FACILITY to nontribal facilities in the 50 states and the District of Columbia in the 2014 JRFC data file, because we did not impute the tribal facilities or the territorial facilities. COLLAPSED\_FACILITY is the same as the cat code on the CJRP data files.

The following procedure assigns the COLLAPSED\_FACILITY code:

1. If the agency checks only one facility type box on the 2014 form, we map the checked box to the appropriate collapsed facility type and COLLAPSED\_FACILITY is set. See Table 9. Note that if the agency only checks “other”, we do not assign a collapsed facility type here.

**Table 9. Collapsed facility type code when only one box marked**

COLLAPSED_FACILITY	Collapsed Facility Type	Check box on 2012 form
0	Detention Center	G_FAC_DET_N_CTR
1	Shelter	G_FAC_RUNAWAY, G_FAC_OTH_SHELTER
2	Reception / Diagnostic Center	G_FAC_RCPTN
3	Training School	G_FAC_TRNING_SCH
5	Ranch, Camp, or Farm	G_FAC_BTCMP, G_FAC_RANCH
6	Halfway House / Group Home	G_FAC_GP_HOME, G_FAC_RES_TRMT

2. If the agency checks more than one facility type box on the 2014 form, we determine the collapsed facility type based on a hierarchy. The collapsed facility type code is determined by the highest checked box on the list. If an agency checks boxes that indicate that it is both a reception center and a training school, the assigned code is training school, since the training school is higher up on the hierarchy than reception center is. Table 10 shows the hierarchy.

**Table 10. Hierarchy used when more than one facility type marked on 2014 JRFC**

COLLAPSED_FACILITY	Collapsed Facility Type	Check box on 2012 form
3	Training School	G_FAC_TRNING_SCH
0	Detention Center	G_FAC_DET_N_CTR
2	Reception / Diagnostic Center	G_FAC_RCPTN
5	Ranch, Camp, or Farm	G_FAC_BTCMP, G_FAC_RANCH
1	Shelter	G_FAC_RUNAWAY, G_FAC_OTH_SHELTER
6	Halfway House / Group Home	G_FAC_GP_HOME, G_FAC_RES_TRMT



3. If the collapsed facility type is still missing, we use the facility's cat code from the 2013 CJRP. The facility's answers to the facility type question from the 2013 CJRP are pulled forward.
4. If the collapsed facility type is still missing, we base the COLLAPSED\_FACILITY on the facility's answers in the 2012 JRFC. The facility's answers in the 2012 JRFC are pulled forward.
5. If the collapsed facility type is still missing, OJJDP will assign the code. (This situation occurred for one facility in the 2014 JRFC.)

Table 11 shows the frequency of the methods used to assign collapsed facility type in the 2014 JRFC.

**Table 11. Frequency of methods used to assign collapsed facility code**

Method of assigning collapsed facility type	Frequency
Facility checked one facility type box on 2014 JRFC form	1,652
Facility checked multiple facility type boxes on 2014 JRFC form	321
Facility responses from the 2013 CJRP were used	212
Facility responses from the 2012 JRFC were used	5
Collapsed facility type based on guidance from OJJDP	1
Total	2,191

[The program assign\_collapsed\_facility\_type\_if\_missing.sas creates the COLLAPSED\_FACILITY variable.]

## Pulling Forward Prior Year Data

The imputation process starts by pulling forward prior year data for refusals and critical item facilities (CheckInStatus codes of 5, 7, and 9) and for item nonrespondents.

**Table 12. Questions for which we pull forward data from prior year if current year is missing**

Question	Concept
G_PHY_LAYOUT, G_PHY_LAYOUT_SP	Physical layout of facility
G_OTH_BLDGS	Other buildings?
G_DET_OFLOW	House overflow population?
G_ON_SITE_RES_TRTMNT through G_TYP_OTH_SP	On-site residential treatment?
G_FOSTER_CARE	Provide foster care?
G_INDEPENDENT_LIVING	Independent living?
G_SEP_HOUSING through G_SEP_N1_OF_THE_ABV	Separate sleeping units?
G_FAC_OWND_PRVT through G_FAC_OWND_NAME	Facility ownership
G_FAC_LVL_NATIVE_AMER through G_FAC_LVL_OTH_SP	Level of government that owns facility
G_FAC_OPRTD_PRVT through G_FAC_OPRTD_NAME	Who operates facility
G_FAC_OPRTD_NATIVE_AMER through G_FAC_OPRTD_OTH_SP	Level of government that operates facility
G_LCKD_RMS through G_WHEN_OTH_SP	Juveniles locked in rooms?
G_CNF_SECURE_RMS through G_CNF_N1_OF_THE_ABV	Confine juveniles in specific areas?
G_OUT_DRS_LCKD through G_OUT_DRS_OTH_SP	Outside doors locked?

If the same question appears on the 2013 CJRP, we check the facility's answers on that first, before checking the 2012 JRFC. If the question does not appear on the 2013 CJRP, we check the facility's answers on the 2012 JRFC. Note that a facility may report some of the items in the current year, so the program has to check to see if the item is missing in the current year.

If no prior year data exists for the question, we set the value to 8 (refusal). The program also verifies that we did not overwrite any reported data for those questions.

[The program pull\_forward\_general\_facility\_info.sas does the imputations for the questions listed in Table 12.]

### Creation of Imputation Groups

The next step in the process is to create imputation groups. We create a two-digit state code from the facility ID (note that these are **not** ANSI FIPS codes). We use the two-digit state code to assign a division code to each facility. We then use the division code to assign a region code to each facility. Each facility receives an imputation group code (IMPGRP), which is 4 characters long. The first character of IMPGRP is the region code, the second character is the division code, and the third and fourth characters are the collapsed facility code, formatted with a leading 0. Table 13 summarizes the imputation variables added to the 2014 JRFC file.

**Table 13. Imputation variables added to the 2014 JRFC file**

Variable	Description
COLLAPSED_FACILITY	We collapse the facility type answers, following the CJRP methodology. The values are: 0 – Detention Center 1 – Shelter 2 – Reception / Diagnostic Center 3 – Training School 5 – Ranch, Camp, or Farm 6 – Halfway House/ Group Home
IMPSET	Indicates if the record needed imputation. Value is “needs” when record needs imputation, “donor” when record was used in growth rate calculations. Value is blank for records that were not eligible for imputation.

Variable	Description
DIVISION	Census division code. The values are: 1 – New England 2 – Middle Atlantic 3 – East North Central 4 – West North Central 5 – South Atlantic 6 – East South Central 7 – West South Central 8 – Mountain 9 – Pacific See <a href="http://www.census.gov/geo/maps-data/maps/docs/reg_div.txt">http://www.census.gov/geo/maps-data/maps/docs/reg_div.txt</a> for more details.
REGION	Census region code. The values are: 1 – Northeast 2 – Midwest 3 – South 4 – West See <a href="http://www.census.gov/geo/maps-data/maps/docs/reg_div.txt">http://www.census.gov/geo/maps-data/maps/docs/reg_div.txt</a> for more details.
FACILITY_CODE	Collapsed facility code, formatted with a leading 0.
IMPGRP	Imputation group code. The imputation group code is 4 characters. The first character is the region code, the second character is the division code, and third and fourth characters are FACILITY_CODE. If we need to collapse the imputation group, we collapse first within the region, and the division code is set to 0. If we need to collapse further, we collapse to the national level, and the region code is set to 0.

[The program impute\_JRFC\_counts.sas creates the variables listed in Table 13.]

## Collapsing of Imputation Groups

As mentioned in Table 13, we may need to collapse the imputation group. We require an imputation group to have at least 15 respondents and at least a 75 percent response rate within the group. If the group does not meet either criterion, we collapse the imputation group until it meets both criteria. We first collapse within the region, and set the division code to 0. If we need to collapse further, we collapse to the national level, and the region code is set to 0.

The `impset` variable divides the records eligible for imputation into two groups: donor records and records that need imputation. We classify a facility as needs imputation if either of the following applies:

- Facility is a refusal or critical item facility (`CheckInStatus` of 5, 7, or 9)
- Any of the following counts are missing:
  - Number of persons assigned to beds (`G_NUM_ASS_BDS`)
  - Adults assigned to beds (`G_NUM_21_OLDER`)
  - Number of juveniles assigned to beds (`G_NUM_UND_21`)
  - Number of juvenile offenders assigned to beds (`G_NUM_ASS_OFDRS`)
  - Number of juveniles assigned to beds for reasons other than offenses (`G_NUM_ASS_NONOFDRS`)
  - Number of standard beds (`G_STAN_BDS`).

In 2012, if the number of occupied makeshift beds was missing, we classified the facility as needs imputation. That proved unworkable in 2014 when we made a late decision to change how we impute occupied makeshift beds.

Table 14 shows the imputation groups for the 2014 JRFC with records that need imputation.

**Table 14. 2014 JRFC imputation groups with records needing imputation**

<b>Imputation Group</b>	<b>Description</b>	<b>Donors</b>	<b>Records needing imputation</b>	<b>Percent responding</b>
0002	REGION= Nationwide DIVISION= Collapsed facility= Reception / Diagnostic Center	33	5	86.8
0005	REGION= Nationwide DIVISION= Collapsed facility= Ranch, Camp, or Farm	31	2	93.9
1003	REGION= Northeast DIVISION= Collapsed facility= Training School	25	1	96.2
1006	REGION= Northeast DIVISION= Collapsed facility= Halfway House / Group Home	211	34	86.1
1200	REGION= Northeast DIVISION= Middle Atlantic Collapsed facility= Detention Center	45	8	84.9
2300	REGION= Midwest DIVISION= East North Central Collapsed facility= Detention Center	102	8	92.7
2306	REGION= Midwest DIVISION= East North Central Collapsed facility= Halfway House / Group Home	133	6	95.7
2400	REGION= Midwest DIVISION= West North Central Collapsed facility= Detention Center	53	1	98.1
2401	REGION= Midwest DIVISION= West North Central Collapsed facility= Shelter	23	2	92.0
2403	REGION= Midwest DIVISION= West North Central Collapsed facility= Training School	16	1	94.1
2406	REGION= Midwest DIVISION= West North Central Collapsed facility= Halfway House / Group Home	149	23	86.6
3003	REGION= South DIVISION= Collapsed facility= Training School	39	9	81.3
3006	REGION= South DIVISION= Collapsed facility= Halfway House / Group Home	239	68	77.9

<b>Imputation Group</b>	<b>Description</b>	<b>Donors</b>	<b>Records needing imputation</b>	<b>Percent responding</b>
3500	REGION= South DIVISION= South Atlantic Collapsed facility= Detention Center	80	18	81.6
3501	REGION= South DIVISION= South Atlantic Collapsed facility= Shelter	30	4	88.2
3600	REGION= South DIVISION= East South Central Collapsed facility= Detention Center	48	1	98.0
3700	REGION= South DIVISION= West South Central Collapsed facility= Detention Center	80	5	94.1
3701	REGION= South DIVISION= West South Central Collapsed facility= Shelter	29	2	93.5
4001	REGION= West DIVISION= Collapsed facility= Shelter	31	5	86.1
4006	REGION= West DIVISION= Collapsed facility= Halfway House / Group Home	217	54	80.1
4800	REGION= West DIVISION= Mountain Collapsed facility= Detention Center	56	2	96.6
4803	REGION= West DIVISION= Mountain Collapsed facility= Training School	26	2	92.9
4900	REGION= West DIVISION= Pacific Collapsed facility= Detention Center	94	4	95.9
			<b>265</b>	

[We collapse the imputation groups in the impute\_JRFC\_counts.sas program.]

## Calculations within Imputation Group

Once we have formed imputation groups, we calculate the following growth rates for the donors in each imputation group:

- Adults assigned to beds (G\_NUM\_21\_OLDER)
- Number of juvenile offenders assigned to beds (G\_NUM\_ASS\_OFDRS)
- Number of juveniles assigned beds for reasons other than offenses (G\_NUM\_ASS\_NONOFDRS).

Since these counts are on both the CJRP and JRFC prior year files, we can calculate growth rates from either prior year file. We use PROC UNIVARIATE in SAS to calculate trimmed means within each imputation group, where the trimmed mean removes two observations from each imputation group.

We calculate the ratio of standard beds (G\_STAN\_BDS) to people assigned to beds (G\_NUM\_ASS\_BDS) for each donor facility in each imputation group.

We calculate the following median values for donors in each imputation group:

- Occupied makeshift beds (G\_MKSHFT\_BDS\_TOT)
- Voluntary large muscle activity (G\_LG\_MUSCLE\_ACT).

We calculate the following most commonly reported answers for donors in each imputation group:

- Sleeping room arrangements (G\_NUM\_1\_PERSN through G\_NUM\_25\_PLS)
- Minutes per day of required large muscle activity (G\_REQ\_MINUTES)
- Days per week of required large muscle activity (G\_REQ\_DYS\_PER\_WK).

We calculate the required exercise rate for donor records within each imputation group. The required exercise rate is the number of facilities that answered Yes to G\_REQ\_LG\_MUSCLE divided by the number of facilities that answered G\_REQ\_LG\_MUSCLE.

Table 15, Table 16, Table 17, and Table 18 show the calculations by imputation group for the 2014 JRFC.

**Table 15. Trimmed mean growth rates for prior year population counts**

IMPGRP	Growth rate from prior CJRP			Growth rate from prior JRFC		
	G NUM 21 OLDER	G NUM ASS OFDRS	G NUM ASS NONOFDRS	G NUM 21 OLDER	G NUM ASS OFDRS	G NUM ASS NONOFDRS
0002	1.000000	0.993168	0.953631	1.000000	0.955367	1.006469
0005	1.000000	0.916414	1.014819	1.000000	0.893702	1.000000
1003	0.900000	0.929036	1.000000	1.000000	0.965154	1.000000
1006	0.978723	0.953252	1.007896	1.000000	0.971632	1.007565
1200	1.000000	0.942167	1.000000	1.000000	1.018994	0.937500
2300	0.989247	1.095819	1.000614	1.000000	1.063534	0.985056
2306	1.000000	0.935009	1.137041	0.992000	1.061248	1.030759
2400	1.000000	1.133436	0.989409	1.000000	1.107901	0.900650
2401	1.000000	0.749940	1.160998	1.000000	0.952216	0.822928
2403	1.000000	0.953486	1.000000	1.000000	0.942807	1.000000
2406	0.987654	0.878601	1.011482	1.000000	0.935287	0.989132
3003	1.000000	0.989297	1.000000	1.000000	1.013790	1.000000
3006	1.000000	0.969893	0.962326	1.000000	0.921397	0.994334
3500	1.000000	1.070576	1.000000	1.000000	1.070129	1.000000
3501	1.000000	0.931696	1.242808	1.000000	0.921948	0.866587
3600	1.000000	1.102432	1.000000	1.000000	0.969256	1.000000
3700	1.000000	1.111166	1.000000	1.000000	1.051505	0.931507
3701	1.000000	0.954778	0.884516	1.000000	0.952028	1.127234
4001	1.000000	0.738127	1.607442	1.000000	0.864514	1.060603
4006	0.995968	1.013641	1.133325	1.000000	0.888080	1.009357
4800	1.000000	1.035419	1.000000	1.000000	1.113603	1.000000
4803	1.000000	0.907848	1.000000	1.000000	0.842739	1.000000
4900	1.000000	1.069448	0.978927	1.000000	0.998697	0.926610



**Table 16. Selected medians**

IMPGRP	Medians based on 2014 JRFC				
	G NUM 21 OLDER	G NUM ASS OFDRS	G NUM ASS NONOFDRS	(G STAN BDS / G NUM ASS BDS )	G MKSHFT BDS TOT
0002	0	8.0	0	1.300000	
0005	0	30.0	0	1.333333	
1003	0	21.0	0	1.631579	4
1006	0	7.0	3	1.230769	
1200	0	12.0	0	1.923077	
2300	0	23.0	0	1.411765	3
2306	0	6.0	5	1.261905	2
2400	0	13.0	0	1.750000	1.5
2401	0	1.0	5	1.500000	
2403	0	42.0	0	1.348485	
2406	0	8.0	4	1.200000	1
3003	0	53.0	0	1.181818	
3006	0	8.0	0	1.142857	2
3500	0	27.0	0	1.500000	4
3501	0	4.0	3	1.215385	1
3600	0	14.5	0	2.341667	2
3700	0	20.0	0	1.381628	8
3701	0	0.0	5	1.666667	
4001	0	0.0	6	1.588235	
4006	0	5.0	2	1.200000	
4800	0	12.5	0	1.643750	9
4803	0	51.5	0	1.390097	4
4900	0	23.5	0	2.027397	1

**Table 17. Most commonly reported answers for sleeping room arrangements**

IMPGRP	Most common G NUM						
	1 PERSN	2 PERSN	3 PERSN	4 PERSN	5 10 PERSN	11 25 PERSN	25 PLS
0002	1						
0005							1
1003	1						
1006	1	1					
1200	1						
2300	1						
2306	1						
2400	1						
2401	1						
2403	1						
2406	1	1					
3003	1						
3006		1					
3500	1						
3501		1					
3600	1						
3700	1						
3701	1						
4001	1	1					
4006	1	1					
4800	1						
4803	1						
4900	1						

**Table 18. Median or most commonly reported answers for large muscle activity questions**

IMPGRP	G LG MUSCLE ACT median	Required exercise rate	Most common	
			G REQ MINUTES	G REQ DYS PER WK
0002	1	0.515152	60	7
0005	1	0.645161	60	7
1003	1	0.560000	60	7
1006	1	0.383886	60	7
1200	1	0.533333	60	7
2300	1	0.784314	60	7
2306	1	0.338346	60	7
2400	1	0.566038	60	7
2401	1	0.217391	60	7
2403	1	0.687500	60	7
2406	1	0.523490	60	7
3003	1	0.743590	60	7
3006	1	0.476987	60	7
3500	1	0.625000	60	7
3501	1	0.200000	30	7
3600	1	0.604167	60	7
3700	1	0.675000	60	7
3701	1	0.344828	60	7
4001	1	0.193548	60	7
4006	1	0.382488	60	7
4800	1	0.732143	60	7
4803	1	0.846154	60	7
4900	1	0.702128	60	7

## Imputing Population Counts

Once we have finished the calculations within imputation group, we can impute the population counts on the file. We start by deriving counts when facilities report only some of the counts. If the number of juvenile offenders (G\_NUM\_ASS\_OFDRS) is greater than 0 and the number of juveniles assigned beds for reasons other than offenses (G\_NUM\_ASS\_NONOFDRS) is greater than 0 but the number of juveniles assigned to beds (G\_NUM\_UND\_21) is not reported, we add G\_NUM\_ASS\_OFDRS and G\_NUM\_ASS\_NONOFDRS to derive G\_NUM\_UND\_21 and set the flag for G\_NUM\_UND\_21 to derived. If the number of persons assigned to beds (G\_NUM\_ASS\_BDS) is the same as the number of juveniles assigned to beds (G\_NUM\_UND\_21) but adults assigned to beds (G\_NUM\_21\_OLDER) is missing, we set G\_NUM\_21\_OLDER to 0 and set the flag to derived.

If adults assigned to beds (G\_NUM\_21\_OLDER) is still missing, we impute a value based on one of the following methods:

- If prior year CJRP data are available, we apply the CJRP G\_NUM\_21\_OLDER growth rate to the prior year value.
- If no prior year CJRP data are available but prior year JRFC data are available, we apply the JRFC G\_NUM\_21\_OLDER growth rate to the prior year value.
- If neither prior year CJRP nor prior year JRFC data are available, we use the rounded G\_NUM\_21\_OLDER median value.

If the number of juvenile offenders (G\_NUM\_ASS\_OFDRS) is still missing, we impute a value based on one of the following methods:

- If prior year CJRP data are available, we apply the CJRP G\_NUM\_ASS\_OFDRS growth rate to the prior year value.
- If no prior year CJRP data are available, but prior year JRFC data are available, we apply the JRFC G\_NUM\_ASS\_OFDRS growth rate to the prior year value.
- If neither prior year CJRP nor prior year JRFC data are available, we use the rounded G\_NUM\_ASS\_OFDRS median value.

If the number of juveniles assigned to beds for reasons other than offenses (G\_NUM\_ASS\_NONOFDRS) is still missing, we impute a value based on one of the following methods:

- If prior year CJRP data are available, we apply the CJRP G\_NUM\_ASS\_NONOFDRS growth rate to the prior year value.
- If no prior year CJRP data are available, but prior year JRFC data are available, we apply the JRFC G\_NUM\_ASS\_NONOFDRS growth rate to the prior year value.
- If neither prior year CJRP data nor prior year JRFC data are available, we use the rounded G\_NUM\_ASS\_NONOFDRS median value.

If the number of juveniles assigned to beds (G\_NUM\_UND\_21) is still missing, we add G\_NUM\_ASS\_OFDRS and G\_NUM\_ASS\_NONOFDRS and set the flag for G\_NUM\_UND\_21 to derived.

If the number of persons assigned to beds (G\_NUM\_ASS\_BDS) is still missing, we add G\_NUM\_UND\_21 and G\_NUM\_21\_OLDER and set the flag for G\_NUM\_ASS\_BDS to derived.

If the number of total standard beds (G\_STAN\_BDS) is still missing, we pull forward the prior year JRFC data if available; otherwise we apply the median beds to people ratio to the number of persons assigned to beds (G\_NUM\_ASS\_BDS) and set the flag for G\_STAN\_BDS appropriately.

If the number of occupied makeshift beds (G\_MKSHFT\_BDS\_TOT) is still missing, we pull forward the prior year JRFC data if available. If no prior year data are available from JRFC, we use the median value for G\_MKSHFT\_BDS\_TOT and set the flag for G\_MKSHFT\_BDS\_TOT appropriately.

## **Imputing the Rest of the Values for the 2014 JRFC**

If the answer to the question about young persons having opportunities for voluntary participation in large muscle activity (G\_LG\_MUSCLE\_ACT) is missing, we pull forward the answer from the prior year JRFC if available. If the prior year JRFC data are unavailable, we use the median value within the imputation group.

If the answers to the sleeping room arrangements question (G\_NUM\_1\_PERSN through G\_NUM\_25\_PLS) are missing, we pull forward the prior year JRFC data if available. If no prior year JRFC data are available, we use the most commonly reported answer in the imputation group and set G\_FLG\_NUM\_PERSN appropriately.

If the answers to the required participation in large muscle activity questions (G\_REQ\_LG\_MUSCLE, G\_REQ\_MINUTES, G\_REQ\_DYS\_PER\_WK) are missing, we pull forward the data from the prior year JRFC. If no prior year data are available, we randomly assign an answer to G\_REQ\_LG\_MUSCLE based on the required\_exercise\_rate in the imputation group. If the answer to G\_REQ\_LG\_MUSCLE is Yes and the answers to G\_REQ\_MINUTES and G\_REQ\_DYS\_PER\_WK are still missing, we use the most commonly reported answers for G\_REQ\_MINUTES and G\_REQ\_DYS\_PER\_WK and set the flags appropriately. If the answer to G\_REQ\_LG\_MUSCLE is No and the answers to G\_REQ\_MINUTES and G\_REQ\_DYS\_PER\_WK are still missing, we set both G\_REQ\_MINUTES and G\_REQ\_DYS\_PER\_WK to 0 and set the flags for G\_REQ\_MINUTES and G\_REQ\_DYS\_PER\_WK to derived.

[The program impute\_JRFC\_counts.sas does the calculations within imputation groups and then completes the imputations.]

## **Quality Checks Performed During and After Imputation**

The program that assigns COLLAPSED\_FACILITY checks that all records eligible for imputation have collapsed facility type assigned. If there are records for which collapsed facility type is missing, we generate a report for analyst review.

The program verify\_JRFC\_imputations\_complete.sas runs after imputation of the missing values, to check that all the flags are properly set and that all imputed fields have valid values.

The program `check_2014_JRFC_logical_edits_AFTER_IMPUTATION.sas` performs a variety of checks on the imputed data. It looks for mismatches between the screener questions and the follow-up questions. It checks the facility counts: total persons assigned to beds is the sum of adults and juveniles, the sum of juvenile offenders and juvenile nonoffenders sums to the number of juveniles.

## Description of the 2014 JRFC Imputed File

For ease of use, OJJDP requested an Excel spreadsheet for the 2014 JRFC imputed file, in addition to the ASCII file. Note that the Excel spreadsheet is sorted by facility ID. Use the `status_flag_2014` and `occupied_flag_2014` to group the records for analysis.

## Notes on the 2014 JRFC Imputation System

We used SAS 9.4M2 in the Census Bureau's Virtual Desktop Infrastructure (VDI) environment to do the imputation processing.

We edited a copy of the record layout provided by CJB so that the imputation system could read it directly into SAS. Using the metadata directly from the modified record layout allows us to minimize hardcoding values in the SAS programs. We used the record layout metadata to:

- put the variables in the proper record layout order,
- convert text fields to numeric,
- recode items where 0 is not a valid answer,
- recode variables on the prior year files to match the new variable naming conventions,
- provide explanatory text in the table of response rates by item,
- dynamically create the put statement used to create the ASCII final imputed file.

See Dilorio and Abolafia (2004) and Dilorio and Abolafia (2006) for good background papers on using metadata in SAS programming. Other examples by this author are online at [http://www.sascommunity.org/wiki/Presentations:Dorinski\\_Papers\\_and\\_Presentations](http://www.sascommunity.org/wiki/Presentations:Dorinski_Papers_and_Presentations).

The imputation system consists of a driver program written in SAS that calls all the other programs in turn. We redirect the SAS log to a file, which we automatically convert into PDF. We use a date stamp on the output files, so that we can rerun the system if needed without overwriting earlier results.

The 2014 imputation system can run as quickly as 5 minutes. In the author's experience, the VDI servers tend to be busiest from 10 am to noon and from 1 pm to 3 pm. When running the imputation system during those hours, it can take as long as 13 minutes. The load on the VDI servers is lighter as the afternoon progresses and employees with earlier tours of duty finish their days. The author has found quicker run times when starting the imputation system after 4:30 pm. [The next version of the VDI environment should result in more consistent run times. Ten to twelve employees currently share a server, and one employee performing a resource-intensive task can affect the other employees on the server. In the next version of VDI, each employee on the server will have a resource allocation limit, so that one employee is not slowing down the other employees on the shared server.]

We use the ODS Excel destination and the ODS PDF destination to produce reports for analyst review. The imputation processing is an iterative process, with the analysts researching unusual values in the edited file before the production imputation system run. We generate RTF files for the tables that are included in this document. We generate PNG files using PROC SGPLOT for the graphics in this document. We use PROC EXPORT to create the Excel spreadsheet version of the final imputed file. We use PROC REPORT and the PDF destination to produce the more than 150 tables that accompany the final imputed file.

## Data Quality Issues in Makeshift Beds Question

According to the 2010 JRFC imputation documentation, the value for occupied makeshift beds was imputed for 21 facilities by deriving the value. The SAS programs for the 2010 JRFC imputation processing show that the refusal facilities were assigned an answer of No for the screener question, unless the number of persons assigned to beds was greater than the standard number of beds, in which case occupied makeshift beds was set to the difference between persons assigned to beds and standard beds.

For the 2012 JRFC, the author noticed that very few facilities were reporting occupied makeshift beds, so she asked Heather West<sup>1</sup> for guidance on how to impute occupied makeshift beds if the facility did not answer the screener question. Heather mentioned that the number of standard beds is similar to capacity in jails, and would not change unless the facility added a wing or closed a section. We imputed makeshift beds in 2012 by pulling forward prior year data if available, or using the median value in the imputation cell if prior year data were not available. The result was that no facility was imputed as having occupied makeshift beds.

For the 2014 JRFC, the author noticed that the total number of reported occupied makeshift beds remained the same, and under the prior imputation methodology, no facility was imputed as having occupied makeshift beds. That prompted the author to look more closely at the question wording, and then at the record layouts.

The 2012 record layout allowed 0 as a valid value for the occupied makeshift beds field. The 2014 record layout allowed 0 as a valid value for the occupied makeshift beds field. With so few facilities reporting occupied makeshift beds, the calculation of the median within imputation groups is sensitive to whether or not the 0 values are included in the calculation. If 0 is a valid value for occupied makeshift beds and the screener question is ignored, every imputation group has a median value of 0 occupied makeshift beds. Table 16 shows the median occupied makeshift beds within imputation group when the 0 values are excluded from the calculations.

As the author pondered which methodology would be better, she searched online for any mentions of occupied makeshift beds from the JRFC collections. The search yielded two documents by Joseph Moone: a Fact Sheet published by OJJDP in 2000, and a paper delivered at the International Conference on Establishment Surveys (ICES), also in 2000. The Fact Sheet mentioned that the JRFC included

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<sup>1</sup> Heather West worked at the Bureau of Justice Statistics before joining Census.

information on the use of bedspace in the facility as an indication of whether the facility is experiencing crowding.

As the ICES paper describes, the occupied makeshift beds question was a compromise when trying to measure the capacity of the juvenile residential facility. Research in the late 1990s showed that juvenile residential facilities have difficulty reporting their capacity. Research also revealed the difficulty in defining a statistical reporting unit for a juvenile residential facility.

The Census Bureau served as the data collection agent for the Annual Survey of Jails (ASJ) from the first data collection in 1982 through the 2014 data collection cycle. The Bureau of Justice Statistics is the sponsor of the ASJ collection. Dorinski worked on the ASJ data collections from the 2000 collection through the 2014 collection. The edit on the capacity question in the ASJ asked jails to confirm **any** change in capacity from year to year, even if the increase or decrease was as small as one inmate.

The JRFC edits do not compare the standard beds and occupied makeshift beds data to the prior year JRFC data. The JRFC edits do not prompt facilities to explain why there are occupied makeshift beds in use if the number of persons assigned to beds on reference day is less than the number of standard beds. Facilities may have good reasons for having occupied makeshift beds when some of the standard beds are not in use. As the ICES paper points out, some facilities perform different functions for different residents. It is possible that the standard beds are assigned by function, and some areas of the facility may be crowded (using occupied makeshift beds because all the standard beds for that function are in use), while other areas have standard beds not in use on reference day. However, it is also possible that one of the counts is incorrect. We recommend an edit to confirm reported occupied makeshift beds when the number of standard beds is greater than the number of persons assigned to beds on reference day. We also recommend edits that compare the data to prior year JRFC data.

There has been substantial turnover in project staff at Census since the beginning of the CJRP data collection in 1997 and the beginning of the JRFC data collection in 2000. The importance of the makeshift beds question as a compromise measure in place of facility capacity may have been overlooked over time. The Census Bureau has a SharePoint team site for the Juvenile Frame Development project. The site contains a library for all the CJRP and JRFC imputation methodology documentation. The evaluation reports produced by the Census Bureau from the original CJRP questionnaire design are available on the team site, along with the two documents by Joseph Moone.



## Recommendations for Future Collections

### Completely revamp the facility IDs

The fact that a change in ownership from private to public or vice versa causes the ID to change is problematic. Historically, CJRP and JRFC have been treated as completely separate data collections that just happen to target the same facilities. It is clear that researchers are interested in analyzing facilities longitudinally. That is difficult to do when the facility ID changes. The facility ID uses a two-digit state code created by Governments Division. That code has been confused with the Federal Information Processing Series (FIPS) state code, also a two-digit code<sup>2</sup>.

The only information that should be encoded in a facility ID is the state where the facility is located. Encoding any other information (e.g. type of facility, or an indicator that the facility serves juveniles) will simply recreate the problems with IDs that change over time.

### Include edit flags in the Liger export file

Currently there is no way to quantify how much of the data in the JRFC file has been edited, because the flags in the record layout that were included in the Liger processing system do not keep track of the editing done by the analysts. The 2014 JRFC flags from the processing system were unusable. The imputation system had to have special routines to figure out what data was actually missing.

While writing this documentation, the author mentioned to Alonzo Johnson that there is no way right now to quantify the amount of editing done on the data. Alonzo pointed out that the Liger processing system does maintain an audit trail, but the indicator variables that show whether the data value has been edited are not part of the export file that is used in the imputation system.

### Analyze the 2014 JRFC paradata

The 2014 JRFC online data collection used the Census Bureau's Centurion system. The author has the paradata file from the Centurion system. The paradata file can be analyzed to figure out which questions online respondents are avoiding, and which questions are problematic in terms of respondents changing answers repeatedly. While 43.5% of the 2014 JRFC facilities used the online reporting option, the method of return code is set once for a facility, and may not reflect the multiple methods used to collect the data from the facility. In particular, we have evidence from another criminal justice survey that some respondents have difficulty logging in and give up, or only provide a handful of items before breaking off. Without analyzing the 2014 JRFC paradata, we have no idea how much of a problem that is for juvenile residential facilities. See Dorinski and West (2014) for more details.

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<sup>2</sup> For more details on American National Standards Institute/Federal Information Processing Standards (ANSI/FIPS) codes, please see <http://www.census.gov/geo/reference/ansi.html>. Eliminating the Governments Division two-digit state code falls under Change Principle 1, using a standard metadata model as shared architecture. The 10 Guiding Change Principles are included in "*The Future of Census Bureau Operations*", available at [https://www.census.gov/content/dam/Census/about/about-the-bureau/PlansAndBudget/FutureofCensusBureauOperations\\_2013-04-25\\_v1.0\\_10ChangePrinciples.pdf](https://www.census.gov/content/dam/Census/about/about-the-bureau/PlansAndBudget/FutureofCensusBureauOperations_2013-04-25_v1.0_10ChangePrinciples.pdf).

The 2014 JRFC paradata file may contain information about 1,056 juvenile residential facilities. Joseph Moone's ICES paper mentions research conducted in the late 1990s during the design phases for the JRFC. In the first design phase, researchers conducted structured interviews with 40 facilities. In the second design phase, researchers conducted cognitive interviewing with 18 facilities. Structured interviews and cognitive interviews are worthy research techniques, but the paradata encompasses many more facilities, and thus should be analyzed to see if respondents are having trouble with any of the questions in the online data collection.

### **Include the mathematical statistician in project meetings**

Historically, the mathematical statistician who handles the missing data has not been included in project meetings. This means that the mathematical statistician has to update the imputation system reactively, instead of proactively. Problems recognized during imputation processing can be difficult, time-consuming, or expensive to fix. The mathematical statistician may be able to offer suggestions at earlier stages in the project, when fixes would be easier, quicker, or cheaper.

### **Use data visualization more**

The package of deliverables to OJJDP includes more than 150 tables. That is a lot of detail for someone to review. Data visualizations might be easier to review quickly. Figure 7 shows the number of nontribal juvenile residential facilities in the 50 states and the District of Columbia by the state juvenile civilian population as of July 1, 2014. [The program `plot_facilities_per_state_against_state_juv_pop.sas` produces the graphic.]

### **Consider additional edits for makeshift beds question**

We recommend an edit to confirm reported occupied makeshift beds when the number of standard beds is greater than the number of persons assigned to beds on reference day. We also recommend edits that compare the data to prior year JRFC data.

### **Share data snapshot with facilities to help "sell" the data collections**

As we noted in the 2013 CJRP imputation methodology documentation, respondents may not understand the purpose of the data collection, nor how the data are used. There seems to be understandable concern on the part of respondents to protect the data about the juvenile offenders they house. However, respondents may not be aware that quite a bit of policy analysis is done at the aggregate level. For example, see "Juvenile prison populations fall as states' changes take effect", by Reid Wilson, published February 1, 2015 in the Washington Post and available online at <https://www.washingtonpost.com/blogs/govbeat/wp/2015/01/29/states-see-marked-drop-in-juvenile-prison-populations-as-reforms-take-hold/>.

We recommend doing more outreach with each data collection, letting the facilities know how the data has been used and why it is important every time it is collected. OJJDP announced via email on October 20, 2015 the availability of a data snapshot based on the 2013 CJRP. Figure 8 shows the data snapshot. The data snapshot would be an excellent addition to the survey package mailed to each facility. The data snapshot should also be available on the online data collection tool.

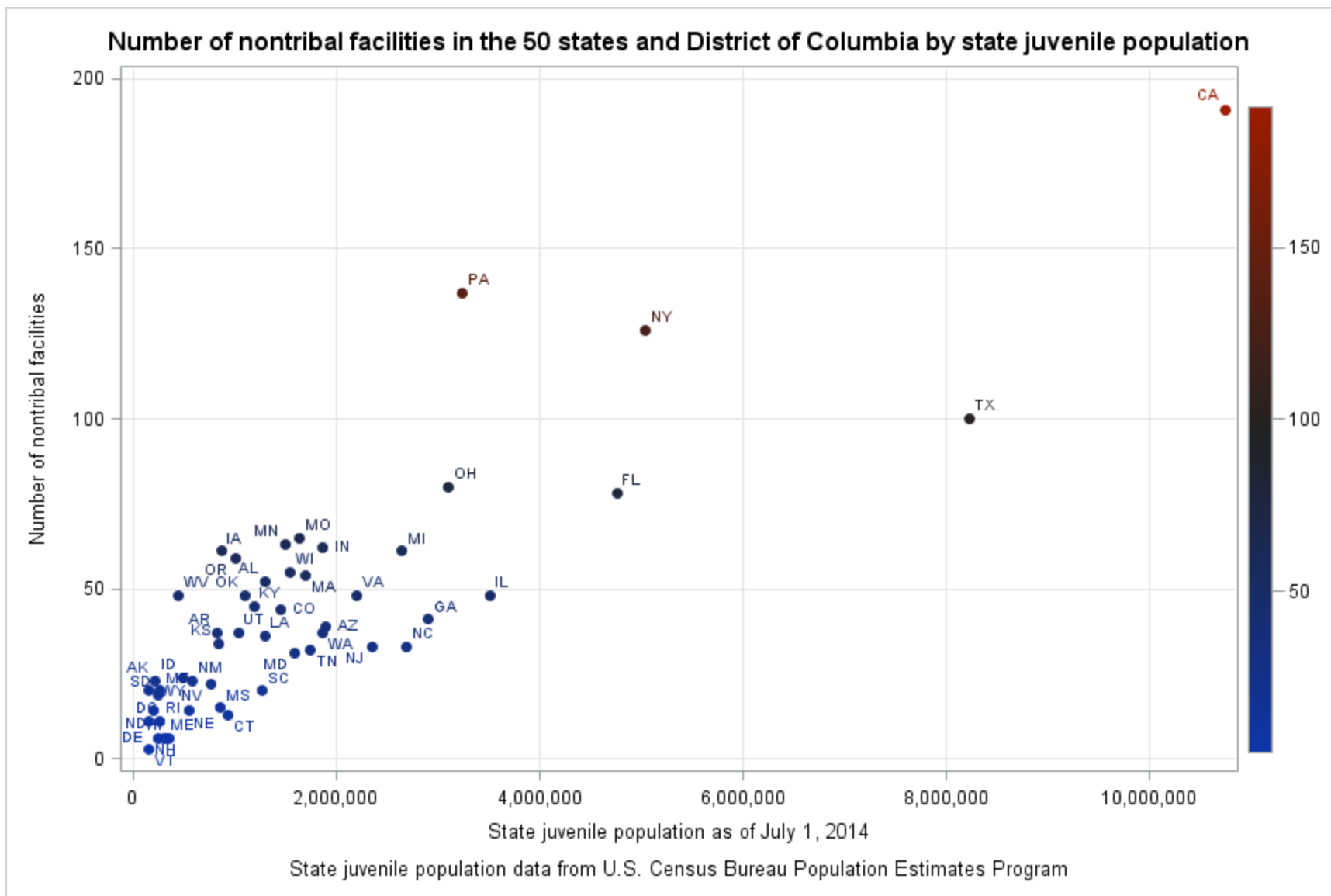
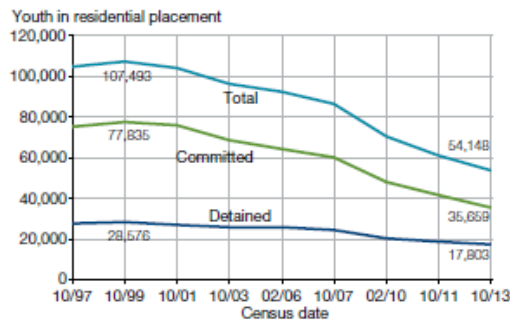


Figure 7. Number of nontribal facilities in the 50 states and District of Columbia by state juvenile population

# The Number of Juveniles in Residential Placement Continued to Decline in 2013

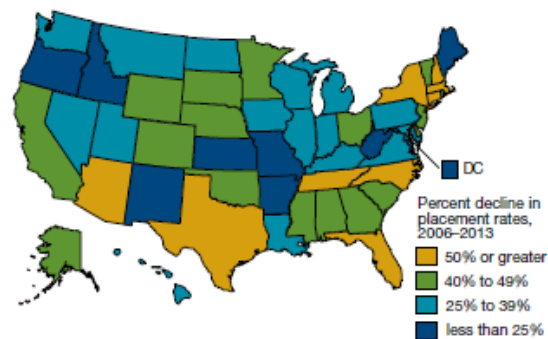
Challenges remain to reduce racial and ethnic disparities and confinement of youth who commit less serious offenses

The number of juveniles in residential placement fell 50% between 1999 and 2013

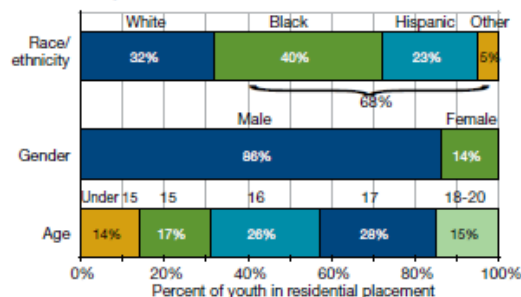


Note: Total includes detained youth, committed youth, and a small number of youth in placement as part of a diversion agreement.

Juvenile placement rates declined in every state from 2006 to 2013; 9 states cut their rates by half or more

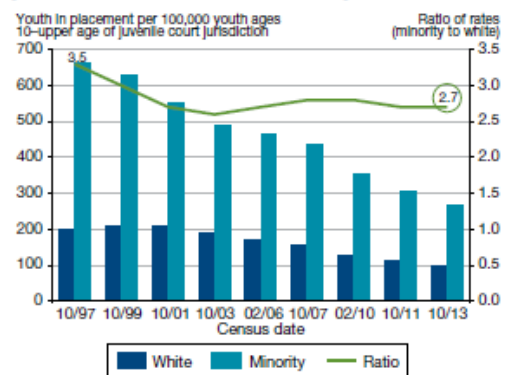


Minority youth accounted for 68% of youth in residential placement in 2013

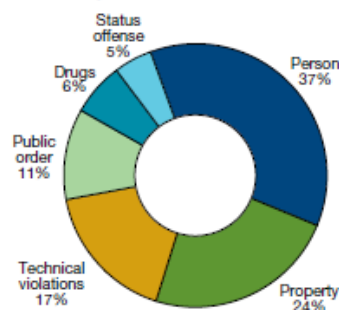


Note: Other race includes American Indian/Alaskan Natives, Asian/Pacific Islanders, and youth of unknown race.

Despite declines, the placement rate for minority youth was 2.7 times that of white youth in 2013



Less than 40% of juveniles in placement in 2013 were held for a person offense



## Statistical Briefing Book [ojjdp.gov/ojstatbb](http://ojjdp.gov/ojstatbb)

Access more information on juveniles in placement

- Review FAQs about juveniles in corrections
- Analyze data with Easy Access to the Census of Juveniles in Residential Placement
- View the glossary of terms, methods, and data collection questionnaires

Data source: Office of Juvenile Justice and Delinquency Prevention. *Census of Juveniles in Residential Placement* [machine-readable data files]. Washington, DC: U.S. Census Bureau (producer).

Figure 8. CJRP 2013 data snapshot

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