

JAMES manual

Stef van Buuren

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Chapter 1

Prerequisites

This is very, very first minimal documentation of JAMES internals.

Chapter 2

Introduction

Here's an introduction about JAMES

Chapter 3

Getting data into JAMES

3.1 Objective

This document describes the format of the input data accepted by JAMES. The specification

- closely follows the definition of the Basisdataset JGZ 3.25 (2018);
- defines data objects;
- defines the actions taken by JAMES in case of incorrect, missing or out-of-range data;
- defines the error messages for informing the client.

3.2 Generic object model

3.2.1 EPremDossier Class

3.2.1.1 Object model

| EPremDossier | Instance | Class |
|--------------|-----------------|--------------------|
| -> | Clientgegevens | EPremGroep |
| -> | Contactmomenten | EPremContactmoment |

3.2.1.2 Syntax C#

```
public class EPremDossier
```

3.2.1.3 Public properties

| Name | Description | Required |
|-----------------|---|----------|
| Clientgegevens | Class with basic child data | Y |
| Contactmomenten | Class with data per visit | N |
| InstrumentCode | Integer identifying the instrument | Ignored |
| OrganisatieCode | Integer identifying the care organisation | Y |
| Referentie | String identifying the request | N |

3.2.2 EPremGroep Class

3.2.2.1 Object model

| EPremGroep | Instance | Class |
|------------|-----------|--------------|
| -> | Elementen | EPremElement |
| -> | Groepen | EPremGroep |

3.2.2.2 Syntax C#

```
public class EPremGroep
```

3.2.2.3 Public properties

| Name | Description | Required |
|-----------|-----------------------------------|----------|
| Elementen | Class with BDS-elements | Y |
| Groepen | Class with groups of BDS-elements | N |

3.2.3 EPremElement Class

3.2.3.1 Syntax C#

```
public class EPremElement
```

3.2.3.2 Public properties

| Name | Description | Required |
|-----------|-----------------------------------|----------|
| Bdsnummer | Integer identifying the BDS-field | Y |

| Name | Description | Required |
|--------------------|------------------------------------|----------|
| InternNummer | Integer identifying internal field | Ignored |
| Waarde | Value of the BDS-field | Y |
| Waardeomschrijving | Descriptive label for value | Ignored |

3.2.4 EPremContactmoment Class

3.2.4.1 Object model

| EPremContactmoment | Instance | Class |
|--------------------|-----------|--------------|
| -> | Elementen | EPremElement |
| -> | Groepen | EPremGroep |

3.2.4.2 Syntax C#

```
public class EPremContactmoment : EPremGroep
```

3.2.4.3 Public properties

| Name | Description | Required |
|-----------|-----------------------------------|----------|
| Elementen | Class with BDS-elements | Y |
| Groepen | Class with groups of BDS-elements | N |
| Tijdstip | Date of visit | Y |

3.3 BDS-elements

| BDS | Description | Value | Label | Required |
|-----|--------------------|--------------------------------------|---|----------|
| 19 | Sex of child | “0” “1” “2” “3” | Unknown Male Female Not specified | Y |
| 20 | Date of birth | “yyyymmdd” | year-month-day | Y |
| 62 | Caretaker relation | “01” “02” “03” “04” “05” | biological father biological mother male partner, stepfather female partner, stepmother adoptive father | N |

| BDS | Description | Value | Label | Required |
|-----|--------------------------|------------|----------------------------|----------|
| | | “06” | adoptive mother | |
| | | “07” | foster father | |
| | | “08” | foster mother | |
| | | “98” | other | |
| 63 | Caretaker date of birth | “yyyymmdd” | year-month-day | N |
| 66 | Caretaker education | “01” | no primary school | N |
| | | “02” | primary school, special ed | |
| | | “03” | VSO-MLK/IVBO/VMBO-LWOO | |
| | | “04” | LBO/VBO/VMBO-BBL&KBL | |
| | | “05” | MAVO/VMBO-GL&TL | |
| | | “06” | MBO | |
| | | “07” | HAVO/VWO | |
| | | “08” | HBO/HTS/HEAO | |
| | | “09” | WO | |
| | | “98” | Other | |
| | | “00” | Unknown | |
| 71 | Caretaker birth country | “dddd” | 4-digit code, Table 34 | N |
| 82 | Gestational age | “ddd” | in days | N |
| 91 | Smoking during pregnancy | “1” | yes | N |
| | | “2” | no | |
| | | “99” | unknown | |
| 110 | Birth weight | “dddd” | 3-4 digits, grammes | N |
| 235 | Length/height | “dddd” | 3-4 digits, millimeters | N |
| 245 | Body weight | “dddddd” | 3-6 digits, grammes | N |
| 252 | Head circumference | “ddd” | 2-3 digits, millimeters | N |
| 238 | Height biological mother | “dddd” | 3-4 digits, millimeters | N |
| 240 | Height biological father | “dddd” | 3-4 digits, millimeters | N |
| 510 | Passive smoking | “01” | No smoking in house | N |
| | | “02” | Never with child | |
| | | “03” | Not in last 7 days | |
| | | “04” | Yes | |

3.4 Error checking

Error checking of the JSON data occurs in three phases:

1. PHASE 1: Check whether the JSON data are valid JSON. The process terminates with an error message if the input JSON is not valid.
2. PHASE 2: Validate the JSON data against the JSON schema specification. The process terminates with an error if any required fields are missing. The process generates messages for data points that do not conform to the JSON schema, but continues.

3. PHASE 3: Check the range of the numeric data. The process generates messages for out-of-range values, but continues using the specified values.

The default JSON schema in phase 2 is the built-in JSON schema `bds_schema_str.json`, a data format implementing a version that accepts strings as values for BDS-elements.

Chapter 4

Growth charts in JAMES

4.1 Chart naming conventions

The link <https://groeidigrammen.nl/ocpu/lib/james/www/> contains an interactive overview of the available growth charts. There are 342 different charts: for boys and girls, for preterms, for different age ranges, for specific ethnic groups, for height, weight, BMI, and so on. Each chart has a chart code, a character code identifying the design. This section explains the construction of the chart codes.

The GitHub repository <https://github.com/stefvanbuuren/chartbox> contains the chart libraries that are available to JAMES. The `list_charts()` function produces a tabular overview.

```
charts <- chartbox::list_charts()
dim(charts)
```

```
## [1] 342    8
```

```
charts[c(1, 22, 23, 300, 301, 340), ]
```

| ## | chartgrp | chartcode | population | sex | design | side | language | week |
|--------|----------|-----------|------------|--------|--------|-------|----------|------|
| ## 1 | nl2010 | HJAA | HS | male | A | front | dutch | |
| ## 22 | nl2010 | HMBH | HS | female | B | hgt | dutch | |
| ## 23 | nl2010 | HMBR | HS | female | B | wfh | dutch | |
| ## 300 | preterm | PMEAN32 | PT | female | E | front | dutch | 32 |
| ## 301 | preterm | PMEAN33 | PT | female | E | front | dutch | 33 |
| ## 340 | who | WMBA | WHOpink | female | B | front | dutch | |

The `chartbox` package currently contains three chart groups: `nl2010`, `preterm` and `who`. Each group collects charts of a similar type.

| Chart Group | Charts | Chart code | Description | Source |
|----------------|--------|------------|---|------------------------------|
| n12010 | 136 | CCCC | Dutch children 0-21 years, including minorities | Talma et al. (2010) |
| preterm | 192 | CCCCCNN | Dutch preterms, ga \leq 36 weeks, 0-4 years | Bocca-Tjeertes et al. (2012) |
| who | 14 | CCCC | WHO Child Growth Standards 0-4 years | WHO |

The chart code is an alpha-numeric code of four (for **n12010** and **who**) or seven (for **preterm**) that uniquely identifies each of the charts. The table below specifies the full coding schema used to construct the chart codes.

| Position | Field | Value | Description |
|----------|------------|-------|-------------------------|
| 1 | Population | N | Dutch |
| | | T | Turkish |
| | | M | Moroccan |
| | | H | Hindostan |
| | | P | Preterm |
| | | W | WHO |
| 2 | Sex | J | Male |
| | | M | Female |
| 3 | Design | A | 0-15 months |
| | | B | 0-4 years, WFH |
| | | C | 1-21 years |
| | | D | 0-21 years |
| | | E | 0-4 years, WFA |
| | | X | A4, double sided |
| 4 | Side | A | A4, front |
| | | B | A4, back |
| | | C | A4, back, no hdc |
| | | H | square, hgt |
| | | O | square, hdc |
| | | Q | square, bmi |
| | | R | square, wfh |
| | | W | square, wgt |
| 5 | Language | N | Dutch |
| | | E | English |
| 6-7 | Week | 25-36 | Gestational age |

For illustration, code **NJAA** references to Dutch (**N**), boys (**J**), 0-15 month (**A**), front side (**A**). Likewise, **PMEAN33** codes for the chart of preterm (**M**), girls (**M**), 0-4 years (**E**), front side (**A**), Dutch language (**N**) born at 33 weeks of gestation (**33**).

Some forms hold multiple growth charts. For example, the **NJAA** chart is designed for A4 paper size (297mm \times 210mm) and contains three growth charts:

head circumference by age, length by age, and weight by age. Some others have no diagram, like NJAB with explanations. All square formats hold one growth chart. All of the square forms have equal sizes (160mm \times 160mm).

The following table lists the measures per design-form combination.

| Design | Side | Measure | Description |
|--------|------|---------|------------------------------------|
| A | A | hdc | Head circumference by age, 0-15 mo |
| | | hgt | Length by age, 0-15 mo |
| | | wgt | Weight by age, 0-15 mo |
| B | B | | |
| | H | hgt | Length by age, 0-15 mo |
| | O | hdc | Head circumference by age, 0-15 mo |
| | W | wgt | Weight by age, 0-15 mo |
| | A | wfh | Weight for height, 0-4 yr |
| | | hgt | Length by age, 0-4 yr |
| | B | hdc | Head circumference by age, 0-4 yr |
| | C | | |
| | H | hgt | Height by age, 0-4 yr |
| | O | hdc | Head circumference by age, 0-4 yr |
| C | R | wfh | Weight for height, 0-4 yr |
| | W | wgt | Weight by age, 0-4 yr |
| | A | wfh | Weight for height, 1-21 yr |
| | | hgt | height by age, 1-21 yr |
| | B | bmi | BMI by age, 1-21 yr |
| | | hdc | Head circumference by age, 1-21 yr |
| | C | bmi | BMI by age, 1-21 yr |
| | H | hgt | Height by age, 1-21 yr |
| | O | hdc | Head circumference by age, 1-21 yr |
| | Q | bmi | Body mass index by age, 1-21 yr |
| E | R | wfh | Weight for height, 1-21 yr |
| | | | |
| | A | wgt | Weight by age, 0-4 yr |
| | | hgt | height by age, 0-4 yr |
| | B | hdc | Head circumference by age, 0-4 yr |
| | H | hgt | Height by age, 0-4 yr |
| | O | hdc | Head circumference by age, 0-4 yr |
| | W | wgt | Weight by age, 0-4 yr |

Chapter 5

Methods

We describe our methods in this chapter.

Bibliography

- Bocca-Tjeertes, I., van Buuren, S., Bos, A., Kerstens, J., ten Vergert, E., and Reijneveld, S.A. (2012). Growth of preterm and fullterm children aged 0-4 years: Integrating median growth and variability in growth charts. *Journal of Pediatrics*, 161(3):460–465.
- Talma, H., Schonbeck, Y., Bakker, B., Hirasing, R., and van Buuren, S. (2010). *Groeidiagrammen 2010: Handleiding bij het meten en wegen van kinderen en het invullen van groeidiagrammen*. TNO Kwaliteit van Leven, Leiden.