

The `realdentalcosts-data` package

US dental price benchmarks by state, as LaTeX macros

Real Dental Costs Data and Research Team
`research@realdentalcosts.com`

v1.0 — 2026-08-26 (data edition 2026.1 (data generated 2026-08-25))

Abstract

`realdentalcosts-data` provides LaTeX macros that return US dental procedure price benchmarks by state, drawn from the Real Dental Costs Open Data API. Authors of reports, theses, and policy documents can cite a state-level price without retyping a number from a spreadsheet or a web page. The package covers four procedures — root canal, complete dentures, single dental implant, and dental crown — for all 50 states plus the District of Columbia, and Medicaid paid-per-claim-line amounts for two CDT codes. This document explains installation, the macro reference, provenance of the underlying data, and its limitations.

Contents

1	Introduction	1
2	Installation	1
3	Macro reference	2
3.1	Usage examples	2
4	Worked example: root canal by state	3
5	Data provenance	3
6	Limitations	4
7	License	4
8	Maintainer	4

1 Introduction

Dental care cost is one of the most frequently cited — and most frequently mis-cited — statistics in US health policy writing. A single national average conceals large state-to-state variation, and manually transcribing a state figure from a table into a manuscript is both error-prone and hard to keep in sync when the source data is refreshed.

`realdentalcosts-data` solves this by embedding a versioned snapshot of the Real Dental Costs Open Data API as LaTeX macros. Instead of writing a dollar figure by hand, an author writes `\rdcPrice{root-canal}{TX}` and the package returns the correct, attributable number for the state

and procedure requested, with a warning (rather than a wrong number) if the combination does not exist in this edition.

The package is a *data* package: it ships no visual formatting, tables, or graphics of its own. It only defines macros that expand to plain numbers (and two short citation strings), so it composes cleanly with any table, sentence, or figure caption an author already has.

2 Installation

Place `realdentalcosts-data.sty` in the same directory as your `.tex` file, or install it into your local TeX tree under `texmf/tex/latex/realdentalcosts-data/` and refresh the filename database (`texhash` or `mktextlsr`). Then load it in the preamble:

```
\usepackage{realdentalcosts-data}
```

The package has no dependencies beyond core LaTeX2e: it uses only `\csname`, `\expandafter`, and `\newcommand` from the kernel. It works under pdfLaTeX, XeLaTeX, and LuaLaTeX.

3 Macro reference

Macro	Arguments	Returns
<code>\rdcPrice</code>	<code>{slug}{ST}</code>	average self-pay price, USD
<code>\rdcPriceLow</code>	<code>{slug}{ST}</code>	low end of the price band
<code>\rdcPriceHigh</code>	<code>{slug}{ST}</code>	high end of the price band
<code>\rdcNational</code>	<code>{slug}</code>	US national average self-pay price
<code>\rdcMedicaidPaid</code>	<code>{CDT}{ST}</code>	latest Medicaid paid amount per claim line
<code>\rdcDataVersion</code>	—	dataset edition and generation date
<code>\rdcSource</code>	—	citation string for the underlying data

All price macros return a plain number, thousands-separated with a comma, with no currency sign, so that an author can choose their own typesetting (e.g. prefixing `\$`, or feeding the number to `siunitx`). `\rdcMedicaidPaid` returns a decimal amount with two digits after the point.

Procedure slugs recognised in this edition: `root-canal`, `dentures`, `dental-implant`, `dental-crown`.

State codes: the standard 2-letter USPS abbreviation, plus `DC` for the District of Columbia — 51 jurisdictions in total for every procedure.

Medicaid CDT codes covered in this edition: `D3330` (molar root canal, published for 48 states) and `D5110` (complete upper denture, published for 41 states — HHS suppresses a state/code cell when it has fewer than 12 claim lines or 12 patients, so not every state publishes every code).

If a macro is called with a slug, state, or CDT code that does not exist in this edition, it issues a `\PackageWarning` at compile time and typesets the literal text `n/a` rather than silently failing the build or fabricating a plausible-looking number.

3.1 Usage examples

Citing a single state price in running text.

The average self-pay cost of a root canal in Texas is approximately `\$\rdcPrice{root-canal}{TX}` (range `\$\rdcPriceLow{root-canal}{TX}--\$\rdcPriceHigh{root-canal}{TX}`), against a US national average of `\$\rdcNational{root-canal}`.

Renders as: *The average self-pay cost of a root canal in Texas is approximately \$1,080 (range \$490–\$1,470), against a US national average of \$1,100.*

Building a comparison table.

```
\begin{tabular}{lrrr}
\toprule
State & Low & Average & High \\
\midrule
California & \rdcPriceLow{dentures}{CA} & \rdcPrice{dentures}{CA}
& \rdcPriceHigh{dentures}{CA} \\
Texas & \rdcPriceLow{dentures}{TX} & \rdcPrice{dentures}{TX}
& \rdcPriceHigh{dentures}{TX} \\
\bottomrule
\end{tabular}
```

Citing a Medicaid paid amount with the data version.

Medicaid programs paid an average of $\rdcMedicaidPaid{D3330}{CA}$ per claim line for a molar root canal (CDT D3330) in California, 2023--2024 ($\rdcDataVersion$). Data: $\rdcSource$.

Renders as: *Medicaid programs paid an average of \$492.64 per claim line for a molar root canal (CDT D3330) in California, 2023–2024 (2026.1 (data generated 2026-08-25)). Data: Real Dental Costs Open Data API, <https://realdentalcosts.com/en/api/>, CC BY 4.0.*

4 Worked example: root canal by state

Table 1 shows ten states, generated entirely from package macros — no number below was typed by hand into this document.

Table 1: Self-pay root canal price by state (USD)

State	Low	Average	High
Alabama	\$415	\$915	\$1,245
Georgia	\$465	\$1,025	\$1,395
Ohio	\$465	\$1,025	\$1,395
North Carolina	\$470	\$1,035	\$1,410
Michigan	\$480	\$1,055	\$1,440
Texas	\$490	\$1,080	\$1,470
Florida	\$500	\$1,100	\$1,500
Pennsylvania	\$515	\$1,135	\$1,545
New York	\$615	\$1,355	\$1,845
California	\$635	\$1,395	\$1,905
US national	—	\$1,100	—

5 Data provenance

Each procedure and each Medicaid code carries its own provenance and confidence score in the source API; a summary follows.

- **Root canal.** No per-state source exists for this procedure. State figures are the national self-pay range scaled by a state Restorative Cost Index (a modelled estimate, confidence 59/100 in the source dataset). Treat root canal state figures as directional, not measured.
- **Dentures, dental crown.** The state *average* is a measured price from the ASQ360°/CareCredit Average Procedural Cost Study 2023–2024 (confidence 65/100). The low/high band around that average is modelled from published national ratios, not an observed percentile.
- **Dental implant.** The state average is Real Dental Costs’ own observed cash-price series across 51 state markets (DOI 10.5281/zenodo.20531728), validated against ASQ360° at Spearman correlation 0.945 (confidence 72/100).
- **Medicaid paid amounts (\rdcMedicaidPaid).** Derived from HHS/CMS Medicaid Provider Spending by HCPCS (T-MSIS), version 2026-02-09, geolocated to a state via provider NPI joined against the NPES registry (99.4% of dental claim lines matched). Underlying dataset DOI: 10.7910/DVN/7F2BZI (Harvard Dataverse). This is a *paid* amount per claim line (sum of paid divided by sum of claim lines), not an allowed amount, a fee schedule, or a patient cost. Several states carry a **nominal_amounts_suspected** quality flag in the source dataset, because managed-care encounters can report artificially low or zero paid amounts; consult the methodology page before citing a flagged state as representative.

6 Limitations

This package is **pricing and market research, not medical, dental, or insurance advice**. It should not be used to make individual treatment or coverage decisions. The figures are state-level averages and modelled bands, not itemised quotes; actual prices vary by provider, insurance status, treatment complexity, and negotiated rates.

The package ships a **fixed snapshot** (data edition 2026.1 (data generated 2026-08-25)). It will not reflect price changes after that date until a new package edition is released; check <https://realdentalcosts.com/en/api/> for the current live data.

CDT procedure code descriptors are copyright American Dental Association and are not reproduced verbatim anywhere in this package; all procedure labels used here are Real Dental Costs’ own wording.

7 License

The package code (**realdentalcosts-data.sty** and this documentation source) is released under the LaTeX Project Public License, version 1.3c (LPPL 1.3c), <https://www.latex-project.org/lppl.txt>.

The underlying numeric data embedded in the macros is released under Creative Commons Attribution 4.0 International (CC BY 4.0), <https://creativecommons.org/licenses/by/4.0/>. When reproducing these figures outside of this package, attribute them as: “Real Dental Costs — <https://realdentalcosts.com>”.

8 Maintainer

Real Dental Costs Data and Research Team

research@realdentalcosts.com

<https://realdentalcosts.com/en/methodology/>