



This is a repository copy of *Analysis of prosthetic joint infections following invasive dental procedures in England*.

White Rose Research Online URL for this paper:  
<https://eprints.whiterose.ac.uk/180514/>

Version: Supplemental Material

---

**Article:**

Thornhill, M. [orcid.org/0000-0003-0681-4083](https://orcid.org/0000-0003-0681-4083), Crum, A. [orcid.org/0000-0001-9310-8536](https://orcid.org/0000-0001-9310-8536), Rex, S. et al. (8 more authors) (2022) Analysis of prosthetic joint infections following invasive dental procedures in England. *JAMA Network Open*, 5 (1). e2142987. ISSN 2574-3805

<https://doi.org/10.1001/jamanetworkopen.2021.42987>

---

**Reuse**

Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

**Takedown**

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing [eprints@whiterose.ac.uk](mailto:eprints@whiterose.ac.uk) including the URL of the record and the reason for the withdrawal request.



[eprints@whiterose.ac.uk](mailto:eprints@whiterose.ac.uk)  
<https://eprints.whiterose.ac.uk/>

## Supplementary Appendix

### Analysis of Prosthetic Joint Infections Following Invasive Dental Procedures in England

#### Brief Title – Prosthetic Joint Infections and Invasive Dental Procedures

**Martin H. Thornhill, MBBS, BDS, PhD<sup>a,b</sup>, Annabel Crum, BSc<sup>c</sup>, Saleema Rex, BA, MSc<sup>c</sup>, Tony Stone, BSc<sup>c</sup>, Richard Campbell, MPH<sup>c</sup>, Mike Bradburn MSc<sup>c</sup>, Veronica Fibisan, PhD<sup>c</sup>, Peter B. Lockhart, DDS<sup>b</sup>, Bryan Springer MD<sup>d</sup>, Larry M. Baddour, MD<sup>e</sup>. Jon Nicholl, DSc<sup>c</sup>,**

<sup>a</sup>Unit of Oral & Maxillofacial Medicine Surgery and Pathology, School of Clinical Dentistry, University of Sheffield, Sheffield, UK; <sup>b</sup>Department of Oral Medicine, Carolinas Medical Center – Atrium Health, Charlotte, NC; <sup>c</sup>School of Health and Related Research, University of Sheffield, Sheffield, UK <sup>d</sup>Joint Replacement Surgeon, OrthoCarolina, Charlotte, NC; <sup>e</sup>Division of Infectious Diseases, Mayo Clinic College of Medicine, Rochester, MN.

#### Contents:

eTable 1. OPCS-4 Procedure Codes for Joint Replacements	Page 2
eTable 2. Supplementary ICD-10 codes used to identify when a causal organism was recorded for LPJI and the nature of that causal organism.	Page 3
eFigure 1. Sensitivity Analysis Using 3-month, 4-month and 5-month Exposure Windows to IDP Before LPJI Admission (Case-Periods) and Different Control Periods in the Case-Crossover Analyses.	Page 4
eFigure 2. Monthly Incidence of Different Dental Procedures Before Hip LPJI Admissions	Page 5
eFigure 3. Monthly Incidence of Different Dental Procedures Before Knee LPJI Admissions	Page 6
eFigure 4. Monthly Incidence of Different Dental Procedures Before ‘Other’ LPJI Admissions	Page 7
eFigure 5. Monthly Incidence of Different Dental Procedures Before ‘Unknown’ LPJI Admissions	Page 8

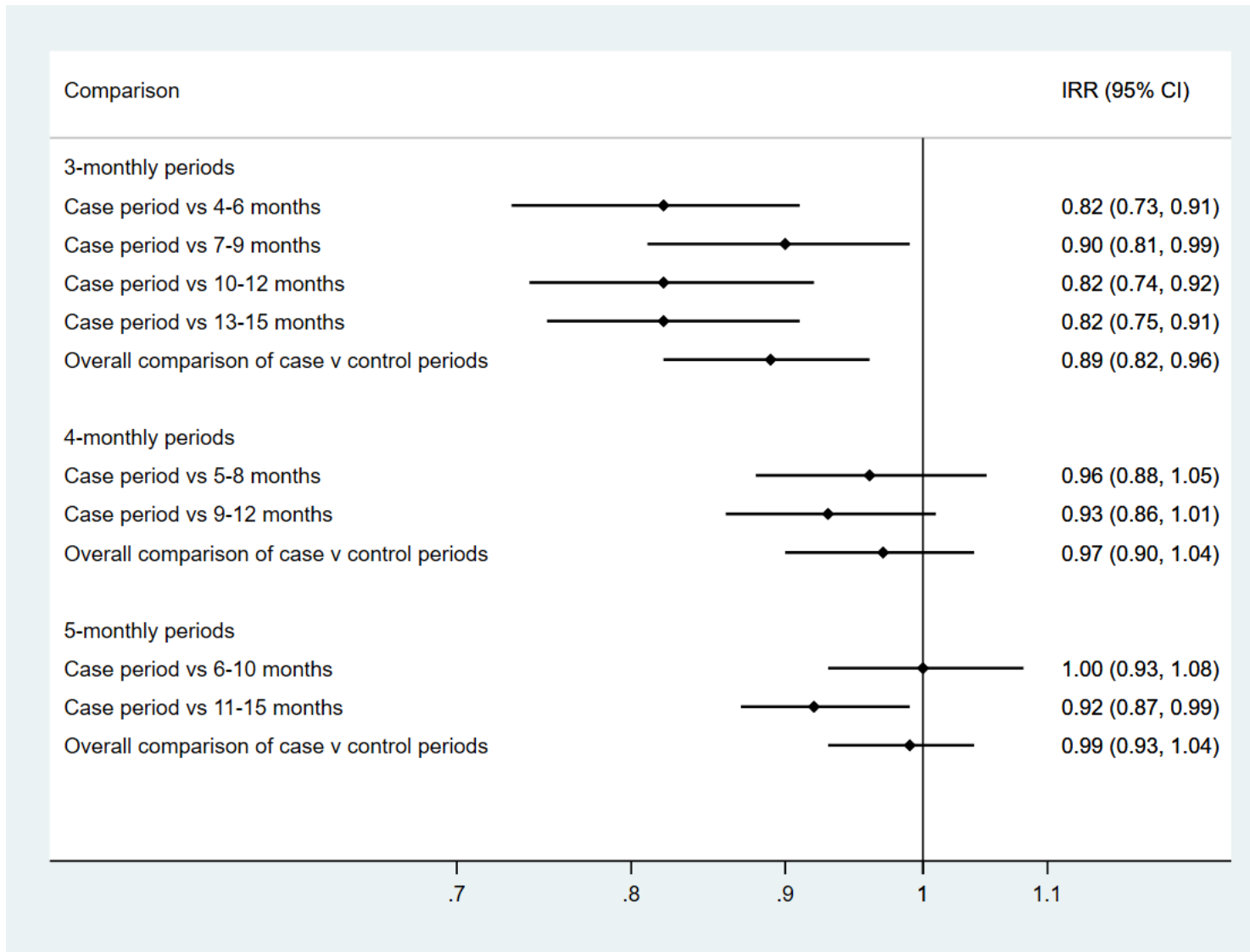
eTable 1. OPCS-4 Procedure Codes for Joint Replacements

<b>Code</b>	<b>Procedure</b>
W37	Total prosthetic replacement of hip joint using cement
W38	Total prosthetic replacement of hip joint not using cement
W39	Other total prosthetic replacement of hip joint
W40	Total prosthetic replacement of knee joint using cement
W41	Total prosthetic replacement of knee joint not using cement
W42	Other total prosthetic replacement of knee joint
W43	Total prosthetic replacement of other joint using cement
W44	Total prosthetic replacement of other joint not using cement
W45	Other total prosthetic replacement of other joint
W46	Prosthetic replacement of head of femur using cement
W47	Prosthetic replacement of head of femur not using cement
W48	Other prosthetic replacement of head of femur
W49	Prosthetic replacement of head of humerus using cement
W50	Prosthetic replacement of head of humerus not using cement
W51	Other prosthetic replacement of head of humerus

eTable 2. Supplementary ICD-10 codes used to identify when a causal organism was recorded for LPJI and the nature of that causal organism.

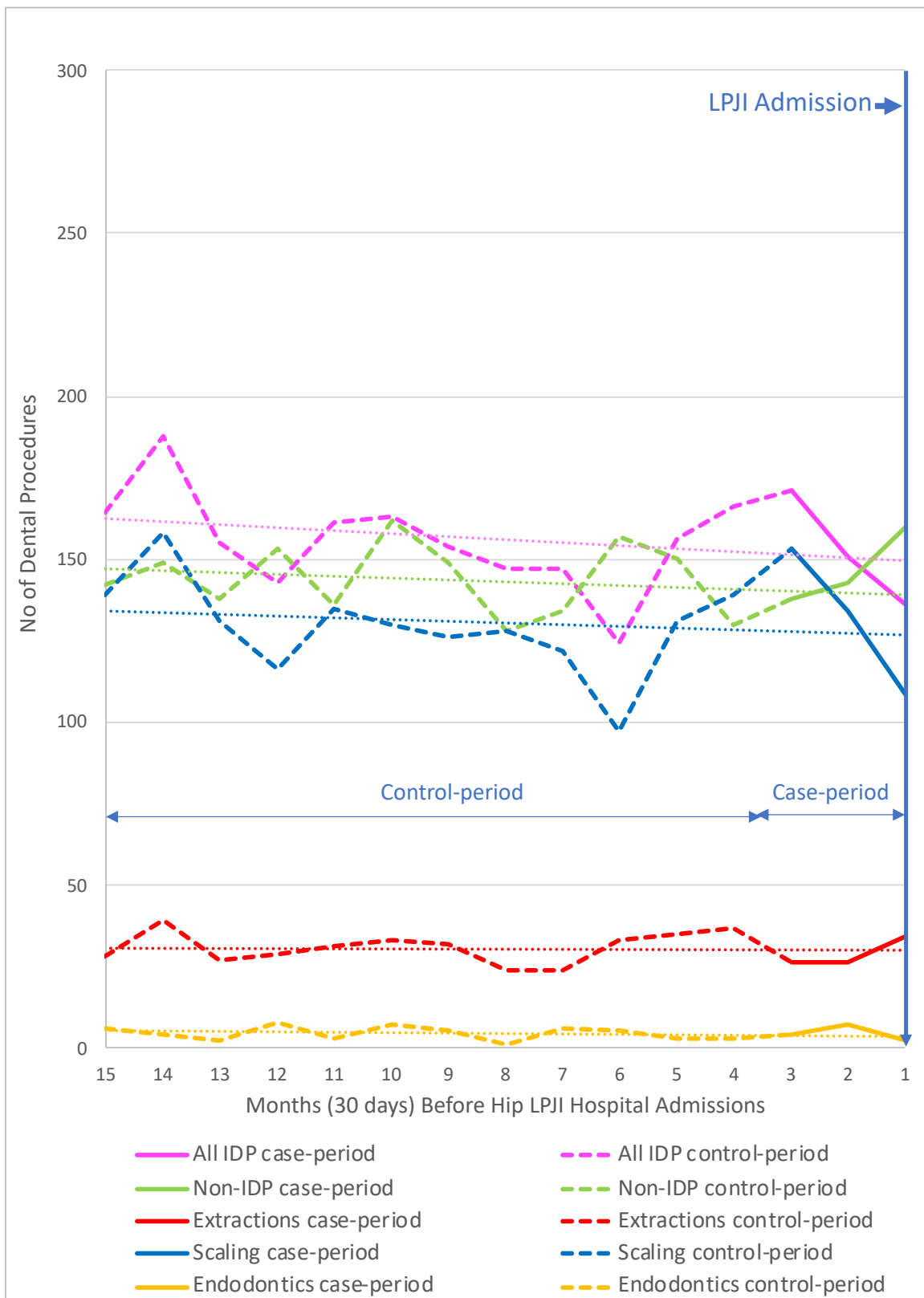
Causal Organism	ICD-10 Codes
(i) Supplementary codes used to identify all LPJI cases where <b>a causal organism</b> was recorded	<p>B95 (and all sub codes) – Streptococcus and Staphylococcus (as the cause of conditions classified elsewhere)</p> <p>B96 (and all sub codes) – Other specified bacterial agents (as the cause of conditions classified elsewhere)</p>
(ii) Supplementary codes used to identify those LPJI cases where <b>oral Streptococci</b> were a possible cause	<p>B95.4 – Other Streptococcus (as the cause of conditions classified elsewhere)</p> <p>B95.5 – Unspecified Streptococcus (as the cause of conditions classified elsewhere)</p>
(iii) Supplementary codes used to identify those LPJI cases where <b>other Streptococci</b> were a possible cause	<p>B95.0 – Streptococcus grp A (as the cause of conditions classified elsewhere)</p> <p>B95.1 – Streptococcus grp B (as the cause of conditions classified elsewhere)</p> <p>B95.2 – Streptococcus grp D (as the cause of conditions classified elsewhere)</p> <p>B95.3 – Streptococcus pneumoniae (as the cause of conditions classified elsewhere)</p>
(iv) Supplementary codes used to identify those LPJI cases where <b>Staphylococci</b> were a possible cause	<p>B95.6 – Staphylococcus aureus (as the cause of conditions classified elsewhere)</p> <p>B95.7 – Other staphylococcus (as the cause of conditions classified elsewhere)</p> <p>B95.8 – Unspecified staphylococcus (as the cause of conditions classified elsewhere)</p>

eFigure 1. Sensitivity Analysis Using 3-month, 4-month and 5-month Exposure Windows to IDP Before LPJI Admission (Case-Periods) and Different Control Periods in the Case-Crossover Analyses.



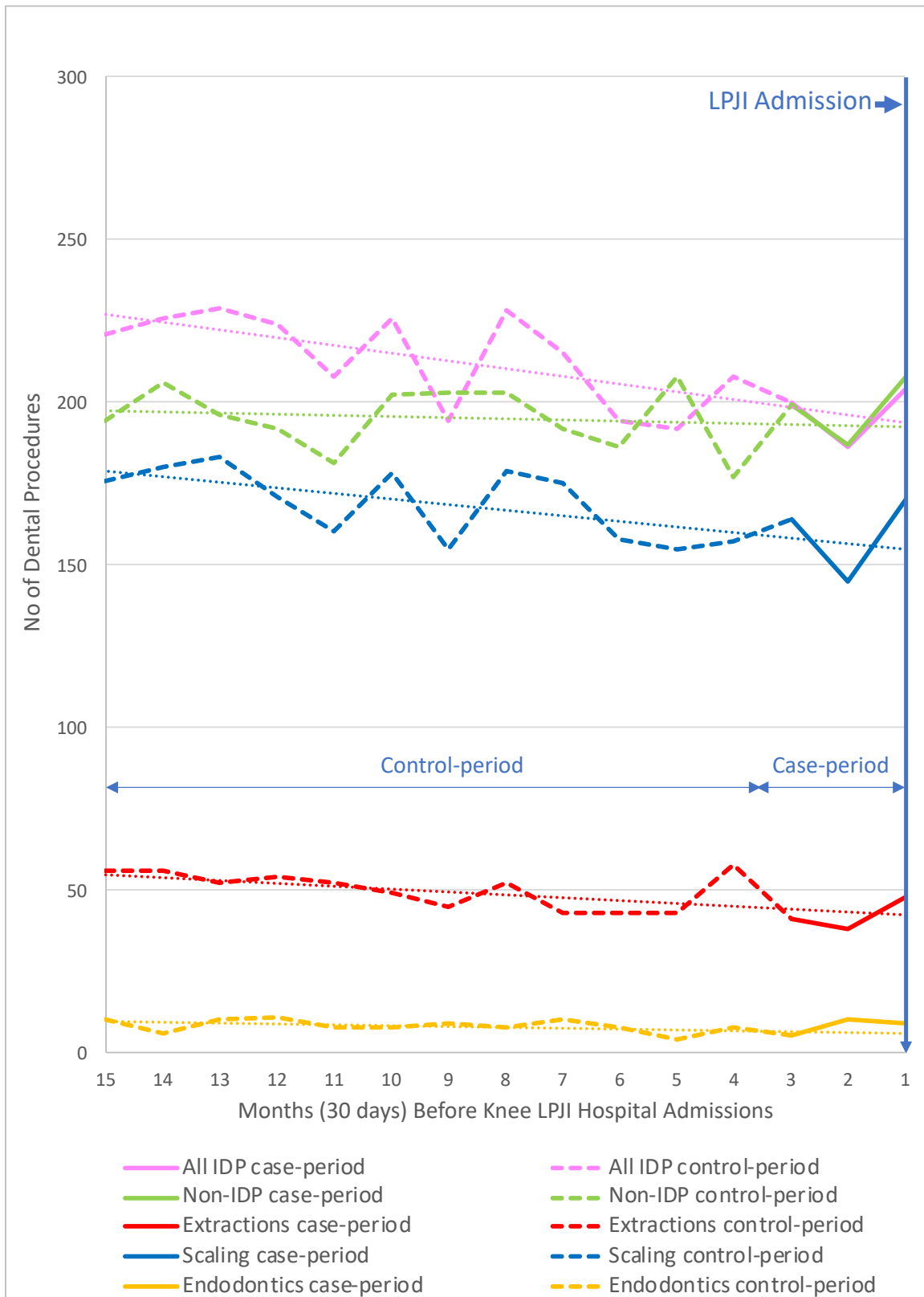
Notes: IDP = Invasive dental procedure, IRR = Incidence Rate Ratio, LPJI = Late prosthetic joint infection.

eFigure 2. Monthly Incidence of Different Dental Procedures Before Hip LPJI Admissions



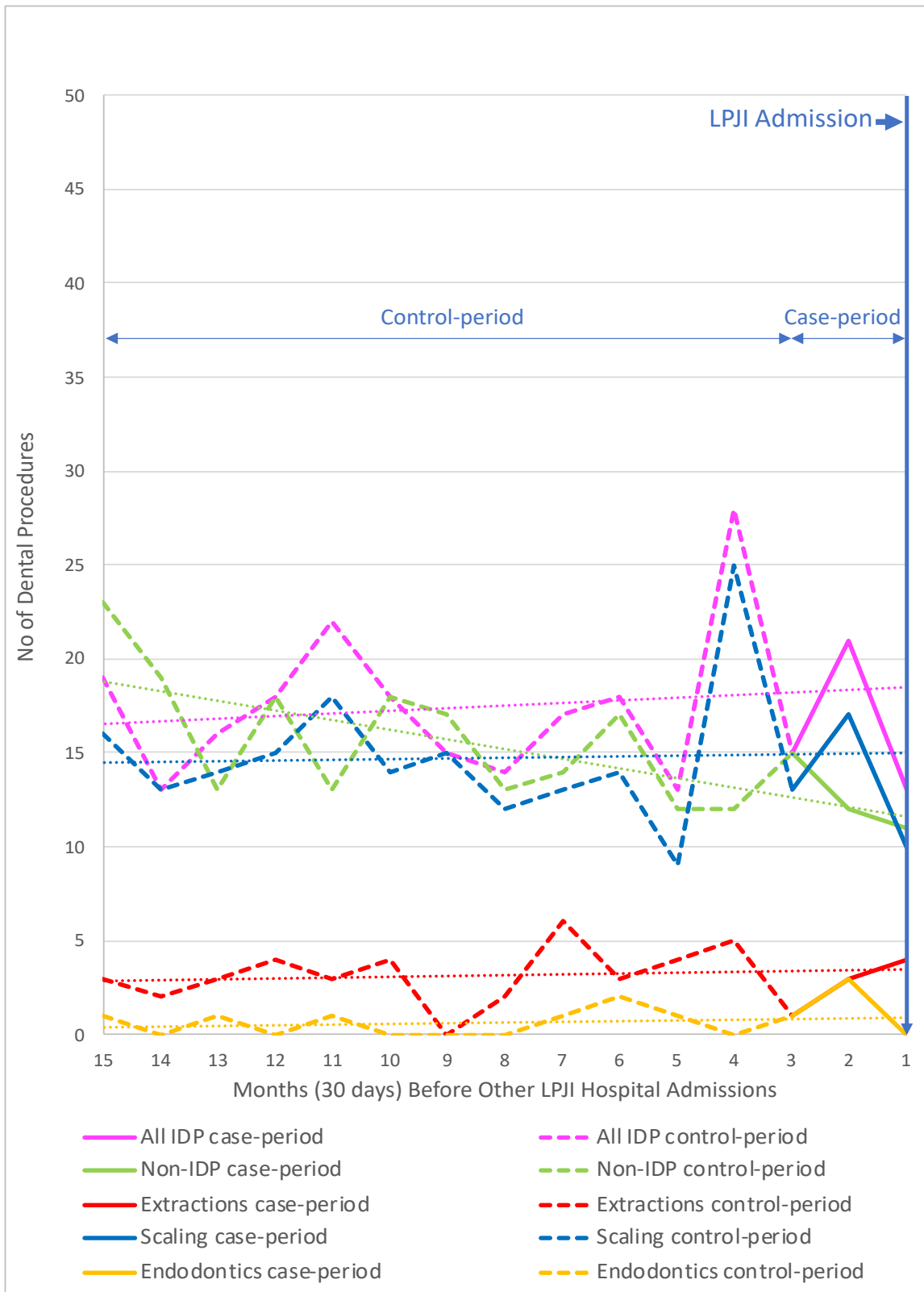
Notes: Solid lines show the monthly incidence of dental procedures during the 3-month case period immediately before IE-admission. Dashed lines show monthly incidence of procedures during the 12-month control period (months 4-15). Dotted line shows the control period trend (extended into the case-period for comparison). LPJI = Late prosthetic joint infection, IDP = Invasive dental procedure.

eFigure 3. Monthly Incidence of Different Dental Procedures Before Knee LPJI Admissions



Notes: Solid lines show the monthly incidence of dental procedures during the 3-month case period immediately before IE-admission. Dashed lines show monthly incidence of procedures during the 12-month control period (months 4-15). Dotted line shows the control period trend (extended into the case-period for comparison). LPJI = Late prosthetic joint infection, IDP = Invasive dental procedure.

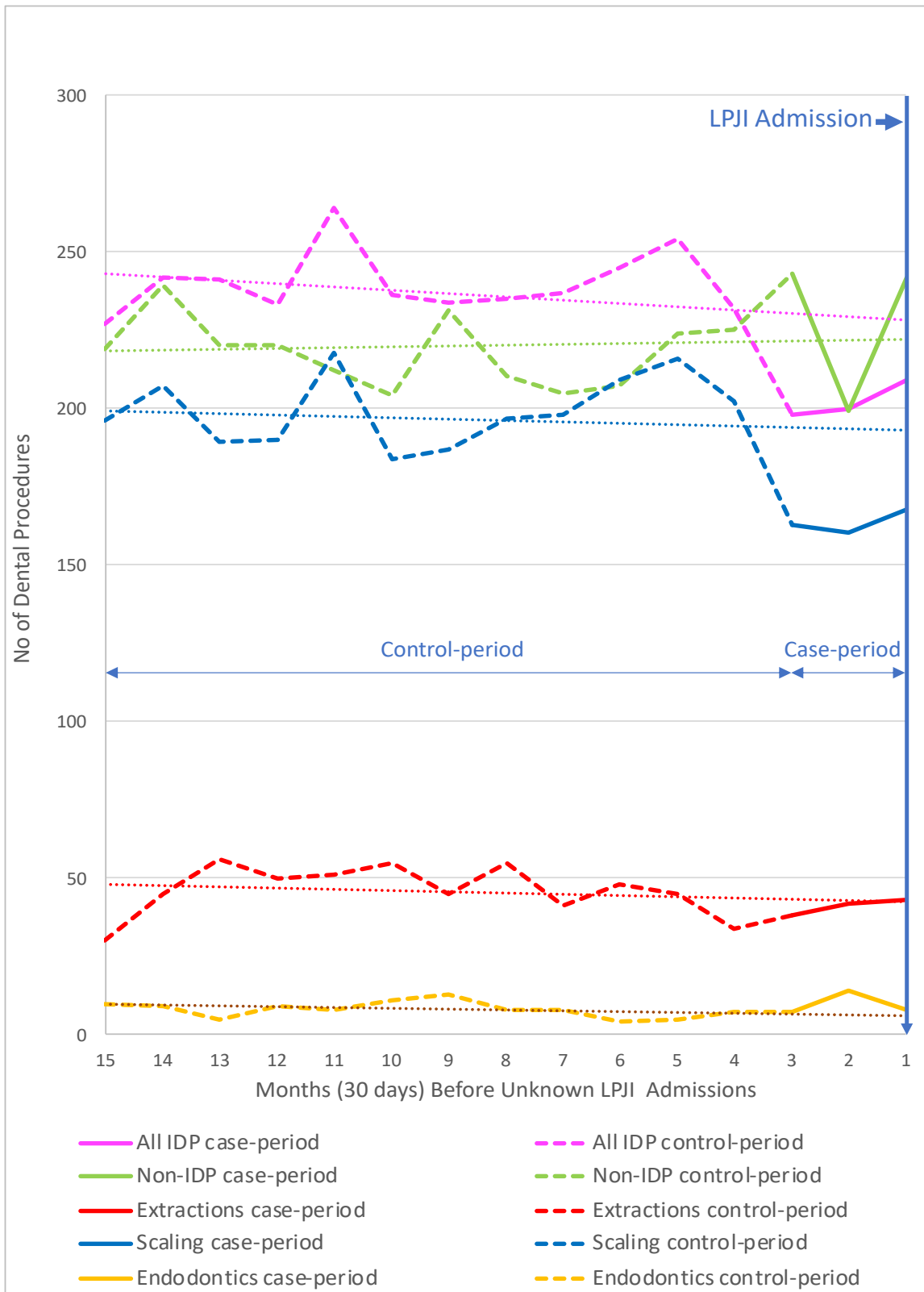
eFigure 4. Monthly Incidence of Different Dental Procedures Before 'Other' LPJI Admissions



Notes: Solid lines show the monthly incidence of dental procedures during the 3-month case period immediately before IE-admission. Dashed lines show monthly incidence of procedures during the 12-month control period (months 4-15). Dotted line shows the control period trend (extended into the case-period for comparison). LPJI = Late prosthetic joint infection, IDP = Invasive dental procedure.



eFigure 5. Monthly Incidence of Different Dental Procedures Before 'Unknown' LPJI Admissions



Notes: Solid lines show the monthly incidence of dental procedures during the 3-month case period immediately before IE-admission. Dashed lines show monthly incidence of procedures during the 12-month control period (months 4-15). Dotted line shows the control period trend (extended into the case-period for comparison). LPJI = Late prosthetic joint infection, IDP = Invasive dental procedure.