**Appendix 1 Dataset Descriptions & Record Linkage Details**

**Dataset Descriptions**

- ScotXed School Pupil Census – the annual census of children in local authority primary and secondary schools, which provided the identifiers for indexing, and also provided the denominator for the cohort. The characteristics of the available children included: local authority of residence, child’s age, sex, ethnicity, and socioeconomic circumstances. The date of the census was 20th September 2011. Note that the Scottish Exchange of Data, ScotXed, is a department of the Scottish Government that facilitates data projects for children and young people. <http://www.gov.scot/Topics/Statistics/ScotXed>

- ScotXed Looked After Children (LAC) dataset – this identified looked after children and their characteristics including: local authority, accommodation, legal reason, and full looked-after episodes dating from 1st August 2007 – 31st July 2012.

- Management Information and Dental Accounting system (MIDAS) – this provided individual level data on patient registration with a primary care NHS dentist and treatment details to indicate levels of dental service access, dating from the years 2008/9 to 2012/13 ending in March 2013. This dataset includes both salaried and non-salaried General Dental Services (GDS).

- Scottish Morbidity Records (SMR01) hospital discharge dataset – this provided dental specialty continuous inpatient stays by diagnosis and procedure codes to specify dental extractions to assess the level of failure of dental preventive care, dating from the years 2008/9 to 2012/13 year ending on the 31st July 2013.

- National Dental Inspection Programme (NDIP) – this provided individual-level data on the dental treatment needs of children in the Primary 1 school year (P1) aged approximately 5-years-old and in Primary 7 (P7) aged approximately 11-years-old. NDIP is collected annually and we accessed the years 2008/9 to 2012/13 ending in the 31st July 2013. The Basic Inspection involves a simple assessment of the mouth of each child using a light, mirror and ball-ended probe. Each child is placed into one of three categories depending on the level of dental health and a letter sent to their parents. Letter A (Urgent dental needs) – severe dental decay and/or abscess and should seek immediate dental care; or Letter B (Non-urgent dental needs) – some decay experience and should seek dental care in the near future; or Letter C (Low dental needs) – no obvious decay but should continue to see the family dentist on a regular basis. If a child refuses an inspection or is absent on the day of inspection the data is recorded with an ‘X’.

**Record Linkage Details**

As part of the wider project leading to the results reported in this paper, our team linked looked after child, education, and health records for the first time in Scotland. In short the linkage process was as follows. Scottish Candidate Numbers (SCN, a unique personal identifier used on all education and relevant social care records in Scotland) which are recorded on looked after child records, were deterministically matched to SCNs recorded on the pupil census (annual census of all children in state funded education in Scotland) to categorise children included in the census as looked after or not.

Personal identifiers contained within the pupil census for all children (pupil date of birth, gender, and home postcode) were then probabilistically matched to the Community Health Index database (master index of all patients receiving NHS care in Scotland, including the NHS unique patient identifier, the CHI number) to generate a SCN-CHI number key. CHI numbers are recorded on all routine health records in Scotland hence the linked CHI numbers were then used to identify relevant health records (dental health, dentist attendance, in-patient dental extractions) for looked after and not looked after children.

Our full study cohort comprises children included in the pupil census (census of children in state funded education) in academic year 2011/12. Children were classified as currently looked after if their Scottish Candidate Number was recorded on a looked after child record during academic year 2011/12. Children were classified as previously looked after if their Scottish Candidate Number had been recorded on a looked after child record during the academic years 2007/08-2010/11 (but not 2011/12). Children were classified as not looked after if their Scottish Candidate Number was not recorded on any looked after child records for academic years 2007/08-2011/12.

Detailed assessment of the quality of data linkage achieved showed that there is a degree of under-recording of the SCN on looked after child records, hence a small number of looked after children in the pupil census will erroneously be classified as not looked after. This would tend to conservatively bias results comparing looked after and not looked after children to the null. Linkage to the CHI database for children within the pupil census classified as looked after and not looked after is very high (around 95%), with minimal potential for bias due to non-linkage. Furthermore, previous work by our team has shown that links made are highly likely (>99%) to be correct (see Wood R, Clark D, King A, Mackay D, Pell J. Novel cross-sectoral linkage of routine health and education data at an all-Scotland level: a feasibility study. Lancet 2013; 382: S10). As CHI numbers are universally required on all routine NHS records, once a link to a child’s CHI number is made, it is assumed that relevant health records will be identified if present.

We are therefore confident that our results provide a robust, population based view of the dental health of looked after children compared to their non-looked after peers.