

# Dental survey of the Falkland Islands' child population

C.M. Jones<sup>1</sup> and B. Walters<sup>2</sup>

<sup>1</sup>Dental Advisor, Falkland Islands Government and NHS Health Scotland, Edinburgh, Scotland, UK; <sup>2</sup>Senior Dental Officer, Falkland Islands Government, King Edward Memorial Hospital, Stanley, East Falkland, Falkland Islands

In November 2013 the first dental epidemiological survey of 5, 12 and 15 year old children was undertaken on The Falkland Islands. The census survey used the ICDAS II system and achieved an overall response rate of 87.4%. To allow international comparisons obvious decay experience is reported. The mean dmft of 5-year-olds was 1.2 teeth, the prevalence of decay experience was 34.6%. The mean DMFT of 12-year-old children was 0.9 teeth, the prevalence of decay experience was 36.7%. The mean DMFT of 15-year-olds was 1.78 teeth, and the prevalence of decay experience was 66.7%. This first dental survey showed that levels of child dental decay in the Falkland Islands are similar to western European countries. The results can now be used as a baseline and benchmark to follow future trends in dental health in this British Overseas Territory.

**Key words:** dental caries, Falkland Islands, British Overseas Territories, children, epidemiological survey

## Introduction

The Falkland Islands is one of 14 British Overseas Territories (BOTs) and comprises an archipelago in the South Atlantic Ocean off the eastern coast of South America. The principal islands lie about 300 miles (500 km) east of the southern Patagonian coast at a latitude of 52°S. The archipelago has a land area of 4,700 square miles (12,173 km<sup>2</sup>); roughly the size of Wales. The two main land masses are East Falkland and West Falkland, with 776 smaller, mainly uninhabited islands. The islands' capital is Stanley on East Falkland. The majority of the population live on East Falkland (94.8%) and mainly in the capital, Stanley (74.7%).

All medical, dental and community health services are based in the King Edward VII Memorial Hospital in Stanley. Healthcare professionals are generally recruited from overseas. As a BOT, the Falklands enjoy internal self-governance, with the United Kingdom taking responsibility for defence and foreign affairs ([www.falklands.gov.fk](http://www.falklands.gov.fk)). The official population of The Falkland Islands in 2012 was 2,840 (Falkland Islands Government, 2013).

The British Overseas Territories, although markedly different in size, economic and social development, and systems of governance, share common features which include relative isolation, exposure to natural disasters, dependence on one or two key industries, and all have opted to remain under British sovereignty rather than, where this is an option, seek independence. Most have permanent civilian populations which are self-governing, and most powers, including provision of healthcare, are devolved to the Territories, but the UK retains responsibility for good governance, defence, and external relations.

The BOTs also have in common, that they are in demographic and epidemiological transition. The prevalence of most communicable diseases has fallen dramatically, while non-communicable health problems such as cardio- and

cerebro-vascular hypertensive disease, diabetes, and cancer have soared often linked to changes in lifestyle. Further, there are problems with continuity of care caused by healthcare professionals being recruited overseas and working on relatively short term contracts. No territory has a population base large enough to supply all of the health expertise it needs and all territories rely on expatriate expertise, particularly in the secondary and tertiary healthcare tiers. Most BOTs provide basic health services but specialist services are often provided by visiting specialists or by sending patients overseas. Dental care is no different. This challenge is increasing in scale and complexity. UK supports limited care through its quota system and/or reciprocal agreements. This is proving economically unsustainable for many BOTs owing chiefly to geographical remoteness and the varying degrees of financial self-sufficiency. The level of child dental health in most BOTs is unknown, although some have been the subject of previous child dental surveys (Table 1).

In the Falkland Islands dental services are run from a two surgery facility based in the main hospital. Preventive dental care is provided when patients attend for dental treatment. Until the mid-1960s dentistry was provided by a travelling dentist who carried portable equipment on horseback. This was then replaced by dental surgeries at the hospital on East Falkland and a Portakabin on the west island. Now all service provision is based in the hospital. The service is comparable with UK NHS dental services.

In Stanley confectionary is plentiful with two small supermarkets and three other shops, all selling confectionary and carbonated drinks. Owing to the partial Argentinian government sea blockade, fresh fruit and vegetables are scarce and relatively expensive. Fresh vegetables and fruit arrive weekly, by air, from Chile, in relatively small quantities which quickly sell out. Such other vegetables as are available are often in poor condition.

**Table 1.** The fourteen British overseas territories and their areas, populations and mean DMFT of their 12-year-olds

<i>Name</i>	<i>Area km<sup>2</sup></i>	<i>Population</i>	<i>Mean DMFT 12-year-olds (year)</i>
Akrotiri and Dhekelia	255	14,000 (about half are military staff)	n/a
Anguilla (WHO, 2014)	91	13,500	1.9 (2005)
Bermuda (WHO, 2014)	54	64,000	0.2 (1989)
British Antarctic Territory	1,709,400	None permanent	n/a
British Indian Ocean Territory	46	3,000 UK/US military staff.	n/a
British Virgin Islands	153	27,000	n/a
Cayman Islands (WHO, 2014)	264	54,878	0.9 (1999)
Falklands Islands	12,173	2,841	0.9 (2013)
Gibraltar (WHO, 2014)	6.5	28,800	1.6 (1991)
Montserrat (Fergus, 2010)	101	4,655	n/a
Pitcairn Islands	45	48 (2012)	n/a
Saint Helena, Ascension Island and Tristan da Cunha	420	5,530	n/a
South Georgia	4,066	None permanent	n/a
Turks and Caicos Islands (2014)	430	32,000	0.92 (2002)

Some people grow their own vegetables, but the climate typically requires two growing seasons. This inevitably influences purchasing decisions and the nature and quality of diet consumed, which, in turn, is a common determinant for poor health including dental caries. However, scurvy is no longer a problem in contrast to the early history of the Islands (Roberts, 1988). Smoking and alcohol consumption statistics are comparable with the UK. Actuarial estimates of life expectancy in 2014 are within 2 years of the UK (male 76 years, female 80 years) (Falklands Islands Government, 2014).

The public water supply is not fluoridated, nor is there any naturally occurring fluoride in the rural water supplies, often drawn from wells or pumped from underground sources.

An annual school dental inspection is carried out on the Falklands where all schoolchildren whose parents/guardians consent are examined by a dentist with a view to reaching those who do not attend for routine care. An Oral Health Strategy was implemented in 2002/03 in response to concerns about the levels of caries and the large number of general anaesthetic extractions regularly being carried out for both adults and children. In 2013, the annual school dental inspections, to consistently and reliably yield useful information on the state of children's dental health, were placed on a sounder epidemiological footing.

## Method

This is a cross-sectional caries prevalence census survey which was carried out in November 2013. One dentist (BW) carried out the survey of all 5, 12 and 15 year old children in the Falkland Islands Community School in the capital Stanley on the Falklands. As there is no research ethics committee covering the Falkland Islands, ethics approval was sought from, and provided by, the Falkland Islands Government.

The International Caries Detection and Assessment (ICDAS) system software was downloaded ([www.icdas.org](http://www.icdas.org)) for online training with extra calibration being undertaken. The ICDAS survey methodology system was used ([www.icdas.org](http://www.icdas.org)) and the examiner was calibrated at the tooth surface level. Intra-examiner reliability was also calculated at the tooth surface level.

Patients were examined in the school using ambient lighting enhanced by battery operated penlights and disposable plane dental mirrors. Cotton wool rolls were available to dry teeth. Staff wore standard personal protective equipment and universal cross infection precautions were adopted. Instruments were all single use and all clinical waste was categorised at source and disposed of in appropriate containers through normal clinical waste procedures. The ICDAS software allows immediate data entry for each subject and the system allocates a serial number in place of the child's name to anonymise the data.

## Results

The school dental survey in the Falkland Islands Community School was successfully carried out in November 2013. A database of all school age children was provided by the Falkland Islands Government. Children were called in individually, their identity confirmed and their confidentiality protected.

The examiner (BW) calibrated successfully with a 'good' classification of Kappa=0.79 (95%CI 0.73 to 0.84) and 'very good' intra-examiner reliability of Kappa=0.89 (95%CI 0.85 to 0.93).

The total number of 5-year-olds (5-6 years of age) resident on the Islands was 33. Six were absent and 1 refused consent. Therefore 26 were examined: a response rate of 79%. Nine children (34.6%) had tooth decay experience (dmft>0). The range was from 0 to 9 teeth affected and the mean dmft was 1.2 teeth. The mean dmft of children with decay experience was 3.44 teeth.

The total number of 12-year-olds (12-13 years of age) was 31 but one was absent. All 30 available children were seen: a response rate of 97%. Eleven children (36.7%) had tooth decay experience (DMFT>0). The range was from 0 to 8 teeth and the mean DMFT was 0.9 teeth. The mean DMFT of 12-year-old children with decay experience was 2.45 teeth.

The total number of 15-year-olds (15-16 years of age) was 31 with 4 being absent the remaining 27 consented and were seen giving a response rate of 87%. Eighteen children (66.7%) had tooth decay experience (DMFT>0). The range was from 0 to 6 teeth and the mean DMFT was 1.78 teeth. The mean DMFT of 15-year-old children with decay experience was 2.67 teeth.

## Conclusions

The survey was successfully completed with good calibration results, intra-examiner reliability and high response rates. The results from the survey are now a benchmark and a baseline to follow trends in dental health of the population.

The proportion of children free from caries experience (dmft/DMFT=0) was about two thirds of the 5 and 12 year olds, although this fell to about one third of the 15-year old children. We speculate that this may represent a cohort effect with the older age range children probably having their first permanent molars before the preventive elements of the Falkland Islands oral health strategy were implemented from 2003; the main recommendations of which were:

1. The public water supply be fluoridated to therapeutic levels
2. Retail policy be challenged and healthy diet be facilitated, including tooth friendly products
3. Community education specifically
  - a. Diet
  - b. Tooth brushing
  - c. Regular dental check ups
4. The dental department implement a recall system to promote regular attendance and all treatment plans to include preventive measures such as pit and fissure sealants, fluoride varnish, oral hygiene instruction and dietary advice at every opportunity.

Recommendations 3 and 4 above, which were under the control of dental personnel, were successfully implemented. Recommendations 1 and 2 have still to be progressed.


The results from this survey allows the level of tooth decay found in 12-year-old children in the Falkland Islands to be compared to Western European and developed countries, with which it is similar. It is considerably better than those nearby South American nations for which data are available.

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