Oral health assessment

BRHS 30 year follow-up (Q30)

2010-2012

The dental examination

The dental examination was part of an extensive physical examination of the BRHS participants at the 30 year follow-up screening in 2010–2012[1]. The dental examination protocol and the data collection form (Appendix 1) can be found below. A list of the dental measurements can be found in the table below.

The physical examination of participants in 2010–2012, at 71–92 years, included for the first time a brief oral health assessment[2]. Dental measures included a count of the number of teeth, and three measures of periodontal disease—periodontal pocket depth (measures the distance between the gum tissue and its attachment to the tooth, loss of attachment (the distance between the point at which the gum is attached and the 'neck' of the tooth where the gum is attached in a healthy tooth), and bleeding on probing (a marker of current inflammation of the gums). Periodontal disease measurements were made in six index teeth (three in the upper arch and three in the lower arch), one per mouth sextant of the mouth. First molars were measured in the four posterior sextants, and right central incisors in the two anterior sextants; where the first molar was missing, the following tooth was chosen in order of priority: second premolar, first premolar, second molar; if the central incisor was missing, the next mesial tooth available in that sextant was chosen. Loss of attachment and gingival bleeding were assessed at two sites (mesiobuccal and distobuccal) on each index tooth, and periodontal pocket depth was measured on the mesiobuccal site. A Community Periodontal Index of Treatment Needs (CPITN) probe was used, with a 0.5 mm ball-ended tip with markings at 0 to 3.5, >3.5 to 5.5 and >5.5 mm. Examiners (research nurses) underwent extensive training and calibration including a pilot prior to the study and a calibration check during the study.

1. Lennon LT, Ramsay SE, Papacosta O, Shaper AG, Wannamethee SG, Whincup PH. Cohort Profile Update: The British Regional Heart Study 1978-2014: 35 years follow-up of cardiovascular disease and ageing. International journal of epidemiology. 2015;44(3):826-g. Epub 2015/08/02.

2. Ramsay SE, Whincup PH, Watt RG, Tsakos G, Papacosta AO, Lennon LT, et al. Burden of poor oral health in older age: findings from a population-based study of older British men. BMJ open. 2015;5(12):e009476. Epub 2015/12/31.

Appendices

Appendix 1 BRHS Q30 Dental examination protocol 2010-12 and data Collection form and.

Dental measurements – BRHS 30 year follow-up (Q30) 2010-2012

Variable Description	Category label/units/range	BRHS VARIABLE NAME	Method section	Data access
Observer	Data is in text format. Observers: GR, IB, NG, RW, xx=missing or home visit	q30dent_obs		yes
Dental examination refusal by participant	1=Yes	q30dent_ref		yes
Problem(technical or participant)	1=Yes	q30dent_prob		yes
Nurse count of Number of teeth in upper arch	1-16	q30nnteeth_u	4.3.7	yes
Nurse count of Number of teeth in lower arch	1-16	q30nnteeth_l	4.3.7	yes
Loss of attachment Mesial Tooth 1	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30LAM1	4.3.8	yes
Periodontal Pocket depth Mesial Tooth 1	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30PPM1	4.3.9	yes
Loss of attachment Distal Tooth 1	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30LAD1	4.3.8	yes
Loss of attachment Mesial Tooth 2	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30LAM2	4.3.8	yes
Periodontal Pocket depth Mesial Tooth 2	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30PPM2	4.3.9	yes
Loss of attachment Distal Tooth 2	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30LAD2	4.3.8	yes
Loss of attachment Mesial Tooth 3	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30LAM3	4.3.8	yes
Periodontal Pocket depth Mesial Tooth 3	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30PPM3	4.3.9	yes
Loss of attachment Distal Tooth 3	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30LAD3	4.3.8	yes
Loss of attachment Mesial Tooth 4	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30LAM4	4.3.8	yes
Periodontal Pocket depth Mesial Tooth 4	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30PPM4	4.3.9	yes
Loss of attachment Distal Tooth 4	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30LAD4	4.3.8	yes
Loss of attachment Mesial Tooth 5	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30LAM5	4.3.8	yes
Periodontal Pocket depth Mesial Tooth 5	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30PPM5	4.3.9	yes
Loss of attachment Distal Tooth 5	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30LAD5	4.3.8	yes
Loss of attachment Mesial Tooth 6	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30LAM6	4.3.8	yes
Periodontal Pocket depth Mesial Tooth 6	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30PPM6	4.3.9	yes
Loss of attachment Distal Tooth 6	0=up to 3.5mm, 1=4 to 5.5, 2=6 to 8.5, 3=9 to 11.5, 8=unscorable, 9=missing	q30LAD6	4.3.8	yes

Variable Description cont.	Category label/units/range	BRHS VARIABLE NAME	Method section	Data access
Gingival bleeding Mesial Tooth 1	1=Yes, 0=No	q30GBM1	4.3.10	yes
Gingival bleeding Distal Tooth 1	1=Yes, 0=No	q30GBD1	4.3.10	yes
Gingival bleeding Mesial Tooth 2	1=Yes, 0=No	q30GBD2	4.3.10	yes
Gingival bleeding Distal Tooth 2	1=Yes, 0=No	q30GBM2	4.3.10	yes
Gingival bleeding Mesial Tooth 3	1=Yes, 0=No	q30GBM3	4.3.10	yes
Gingival bleeding Distal Tooth 3	1=Yes, 0=No	q30GBD3	4.3.10	yes
Gingival bleeding Mesial Tooth 4	1=Yes, 0=No	q30GBM4	4.3.10	yes
Gingival bleeding Distal Tooth 4	1=Yes, 0=No	q30GBD4	4.3.10	yes
Gingival bleeding Mesial Tooth 5	1=Yes, 0=No	q30GBM5	4.3.10	yes
Gingival bleeding Distal Tooth 5	1=Yes, 0=No	q30GBD5	4.3.10	yes
Gingival bleeding Mesial Tooth 6	1=Yes, 0=No	q30GBM6	4.3.10	yes
Gingival bleeding Distal Tooth 6	1=Yes, 0=No	q30GBD6	4.3.10	yes

APPENDIX 1

BRITISH REGIONAL HEART STUDY

BRHS 30 year follow-up (Q30)

2010 - 2012

Oral health assessment

Dental examination protocol

(extract from the **BRHS 2010-12 (Q30) 30yr follow-up Physical examination protocol.pdf**)

Contents

4.3 Dental examination protocol

- A brief oral health assessment will comprise a tooth count and examination of 6 'index' teeth.
- Contraindications – none
- Participants should be seated comfortably on the couch reclining at about 45 degrees – do not place a pillow under the head.

4.3.1 Briefing participant

Very briefly explain the dental examination:

- I would like to do a simple dental assessment.
- I will do a tooth count and look at the gums of only a few teeth and will not disturb any existing dental work or fillings.
- If you would like to close your mouth at any time, please indicate by raising your left hand.

4.3.2 Check for dentures, implants and difficulty opening mouth

Dentures: if partial dentures or complete set in only 1 arch, ask participant to remove denture and place in disposable tray. If complete dentures in upper and lower arch, do not examine and enter tooth count on data sheet.

Implants: this is a whole tooth replacement not just a crown. Ask participant to point to implant if he has one. **Do not probe gums around implants** – choose another tooth in the sextant. This age group is unlikely to have implants.

Difficulty in opening mouth wide: "do you have any problems opening your mouth wide?". If difficulty in opening or clicking of jaw, ask participant to open only as much as he can. If history of dislocation of jaw on opening mouth wide, then do not perform examination.

4.3.3 Examination light

Adjust and position the light while asking the participant to open his mouth.
Headlight is to be worn and adjusted by the examiner.

4.3.4 Dictaphone

The Dictaphone should be placed on the desk and switched on.
When ready for examination, press 'play' on Dictaphone. All measurements will be spoken out loud to record data on the Dictaphone.

4.3.5 Gloves and examination kit

- Put on gloves when ready for examination.
- Open the sterile instrument kit which has a mouth mirror and a CPITN probe.
- Mouth mirror is to be held in left hand and probe in the right hand. Mouth mirror is used both for retraction of cheek/lips and for viewing posterior (back) teeth.
- Correct grasp of probe "modified pen grasp" – note the corner contact points of middle finger and thumb; handle rests against bony area of knuckle.

4.3.6 Dental measurements

Start with saying the batch number to record on the Dictaphone – "batch number …".

Teeth must be examined in the following order:
Always begin from upper right last (distal most) tooth to upper left last tooth; lower left last (distal most) tooth to lower right.

4.3.7 Tooth count

Use the mouth mirror (left hand) to gently retract the cheek for better visibility of the posterior teeth and use the probe to count the teeth (right hand).

Count teeth in the **upper arch** starting from the right and call out "Upper arch …teeth".

Lower arch: start counting from the last tooth (distal most) in the lower left arch.
Count teeth in the lower arch and call out "Lower arch …teeth".

Root stumps (without crown) are not to be included in tooth count; broken tooth can be included even if crown is broken.

4.3.8 Loss of attachment (LoA) and Pocket depth measures

- Upper and lower arches are divided into three sextants:
- Right sextant - premolars and molars (posterior teeth);
- Front sextant - from canine to canine (anterior teeth)
- Left sextant - premolars and molars

One tooth in each sextant of upper and lower arches will be assessed in the following order:

- Tooth 1: Upper right – 1st molar
- Tooth 2: Upper front – right central incisor
- Tooth 3: Upper left – 1st molar
- Tooth 4: Lower left – 1st molar
- Tooth 5: Lower front – right central incisor
- Tooth 6: Lower right – 1st molar

If the 1st molar is missing, move mesial for a premolar; if no premolars, look for 2nd molar.
If right central incisor is missing, move distal to find the next tooth in the sextant.

Two sites to be measured on the buccal side of each tooth (facing the cheek) – mesial and distal – for loss of attachment.
One site (mesial) to be measured for pocket depth.

Start with tooth 1: insert the probe gently in the mesial site to measure the depth of the space between the tooth and gum tissue.

Loss of attachment (LoA) is measured from neck of tooth (junction of crown and root) to base of pocket (as far as the probe goes). Neck of tooth can be identified as either a line along the crown of the tooth, or by darker shade of root surface. Insert the probe in the distal site of tooth 1 and measure loss of attachment.

4.3.9 Pocket depth

Insert probe on mesial site again and measure pocket depth from gingival crest (top of gum) to base of pocket (as far as the probe goes).

Recording measures: Call out scores for the 3 measures for each tooth as follows -
"Tooth 1 mesial …, distal …., pocket …; Tooth 2 mesial …, distal …., pocket …".

Similarly, measure LoA and pocket depth in other teeth. If in doubt, record the lower score.

Score to measure loss of attachment and pocket depth:

0 = First probe band - Up to 3.5 mm
1 = First dark band - 4-5.5 mm
2 = Between two dark bands - 6-8.5 mm
3 = Second dark band - 9+ mm
8 = Unscorable
9 = Missing tooth in sextant

(Score 8 should only be used if the pocket cannot be probed either because of discomfort or because there is a physical barrier e.g. a large shelf of calculus or filling).

When probing lower central incisor or another front tooth, retract lower lip gently with left hand if needed – tense muscles of lower lip maybe difficult to retract with mouth mirror.

Adequate lighting is crucial for reliable measurements – adjust light and headlight as needed during examination.

4.3.10 Bleeding on probing

Bleeding of gums in response to probing should be recorded next. There maybe a delay of 20-30 seconds for bleeding to occur after probing. This will be minor bleeding which will stop.

Score:
0 – no visible bleeding
1 – evidence of bleeding
9 – missing tooth in sextant

Upper arch:
After measuring loss of attachment and pocket depth in the upper arch, go back to tooth 1 to check for bleeding at the 2 sites (mesial and distal). Retract the cheek to observe posterior teeth.

Call out bleeding scores as:
"Measure 2; tooth 1 mesial…; distal…;Tooth 2 mesial…; distal …Tooth 2 mesial …; distal …"

The participant may close his mouth for a couple of seconds before probing teeth in lower arch.

Lower arch:
After recording LoA and pocket depth in lower arch, look for bleeding in tooth 4 to tooth 6.
Call out bleeding scores as:
"Measure 2; tooth 4 mesial…; distal…;Tooth 5 mesial…; distal …Tooth 6 mesial …; distal …"

Press the 'stop' button on the Dictaphone to stop recording.

4.3.11 After examination
Ask the participant to put on dentures if removed.

4.3.12 Disposal of gloves, probe, mirror:
Gloves should be removed inside out and disposed with clinical wastes. Mouth mirror and probe are to be disposed in sharps bin.

4.3.13 Transcribe data from Dictaphone to the data collection form (data entry sheet):
At the end of workstation play back the recording to transcribe data recorded to the data collection form **(**data entry sheet).

Probe grasp:
The probe is to point toward the apex of the tooth, parallel to the long axis of the tooth. If tooth is tilted the probe should be aligned according to the position of the tooth.

The probe is to be held with a light grasp not to exceed 20 grams – it should be possible to remove the probe from the examiner's hand without resistance.

Do not exert force greater than 20 grams. Probing should not cause pain or blanching of the gum tissue, if it does, too much pressure is being exerted. As an indication of the force required when probing, place the probe below your fingernail, this should not be painful if the appropriate pressure is used.

Other points for briefing participant if needed:

- I will use a mirror and a blunt instrument/probe, no sharp instrument; it will not be painful.
- This examination is for only study purposes to specifically examine your gum tissue. I will be calling out numbers that have meaning only for this study.

Possible concerns that might be raised by participants and appropriate responses:

- Treatment: Assure him that the exam will not include treatment, X-rays, a drill, or anaesthesia. Only a mirror and a blunt-ended hand instrument will be used to examine the gums of few teeth.
- Qualifications of the examiner/advice on dental health: The examiner is a registered nurse and would not be in a position to comment on the dental health of the participant.
- Existing dental work: The exam will not interfere with any existing dental work such as fillings, crowns or bridges.
- Pre-existing medical conditions: If participants raise the issue of not probing because of pre-existing medical conditions the following statement may be helpful "In the past there was a policy not to examine the gums of some patients with some heart problems or joint replacements. However, the National Institute for Clinical Excellence (NICE) has recently reviewed the evidence in this area and concluded that there is no significant risk from the examination of teeth and gums. Our policy is in line with this, but if you prefer not to have the gum examination please let me know." Ask for permission to do a tooth count in this case.

- Comment on dental health/ need for treatment: "We are not qualified to comment on your dental health. The exam is not the designed to collect information on which treatment can be planned; the examination is not the same as visiting a high street dentist, which is the best way of ensuring a thorough dental check-up. We cannot check the teeth as thoroughly as a dentist in a surgery." This is not only a way of deflecting potentially difficult questions, it is also absolutely true.

- Reporting serious pathology: If the examiner notices a lesion which he /she considers may be serious and potentially life threatening (such as a suspected malignancy) – examiners are very unlikely to encounter such potentially serious pathology, the incidence of these lesions is very low, the examination is not a screening exercise and does not involve examination of the oral soft tissues (except for gums of some teeth). However, it is possible that such a lesion may be noticed and, as the implications are serious, a protocol to deal with this eventuality is in place.

In the extremely unlikely event that such a lesion is noted, the examiner can make sure that the participant's GP is informed, whilst ensuring not to cause the participant unnecessary worry.

The following wording is suggested –

> "In this survey it is our policy to inform your doctor of any ulcers or inflamed areas we see. As there is an area like this in your mouth I would like to inform your doctor, who should contact you to arrange a check-up. If you do not hear from them in the near future, please arrange your own appointment."
>
> It is most unlikely that any such lesions will be found and it is also unlikely that, even those which are reported, will turn out to be serious. It is the responsibility of the examiner not to alarm the participant unduly.
>
> If the participant asks what the examiner thinks the lesion is, the examiner should answer honestly that they do not know, before re-iterating standard survey policy as above.

STATION 4 Observer ID ☐☐ ☐ Refusal=1 ☐ Prob =1 ORAL HEALTH

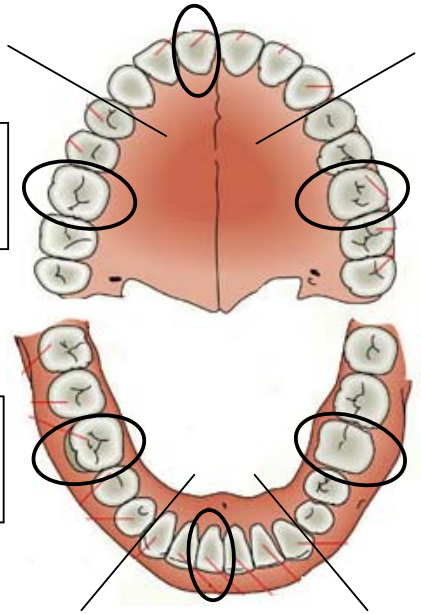
I. TOTAL NUMBER OF NATURAL TEETH: **Upper** ☐☐ **Lower** ☐☐ Batch No: ☐☐☐

II. PERIODONTAL POCKET

2. Mesial = ☐☐
Distal = ☐

1. Mesial = ☐☐
Distal = ☐

3. Mesial = ☐☐
Distal = ☐



6. . Mesial = ☐☐
Distal = ☐

4. . Mesial = ☐☐
Distal = ☐

5. . Mesial = ☐☐
Distal = ☐

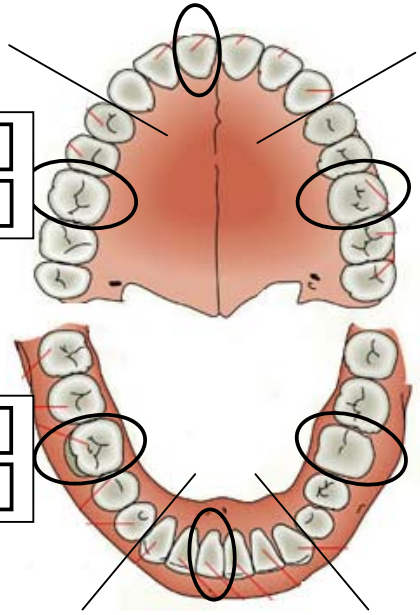
Score -
0 = Up to 3.5 mm (first probe band)
1 = 4 to 5.5 mm (first dark band)
2 = 6 to 8.5 mm (between two dark bands)
3 = 9 to 11.5 mm (second dark band)
8 = Unscorable
9 = Missing

III. GINGIVAL BLEDING

2. . Mesial = ☐
Distal = ☐

1. . Mesial = ☐
Distal = ☐

3. . Mesial = ☐
Distal = ☐



6. . Mesial = ☐
Distal = ☐

4. . Mesial = ☐
Distal = ☐

5. . Mesial = ☐
Distal = ☐

Score -
Yes = 1
No = 0
Missing = 9