Physical activity and respiratory health (PhARaoH): Data from a cross-sectional study

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The dataset consists of a densely phenotyped sample of adults collected from March to August 2014. The dataset captures behavioural, physical, physiological and psychosocial characteristics of individuals with and without a General Practitioner diagnosis of chronic obstructive pulmonary disease (COPD). Data were collected at Glenfield Hospital on 436 individuals (139 COPD patients and 297 apparently healthy adults) aged 40–75 years, residing in Leicestershire and Rutland, United Kingdom. The dataset includes seven days of raw wrist-worn accelerometry, venous blood biomarkers, non-invasive point-of-care cardio-metabolic risk profiles, physical measures and questionnaire data.

Keywords: Physical activity; respiratory; accelerometry; health

Funding statement: NHS England facilitation funds.
The database comprises 139 (31.9%) COPD patients (65.8 ± 7.0 years, 66.2% male) and 297 (68.1%) apparently healthy adults (56.8 ± 8.9 years, 37.0% male). COPD patients comprise 133 (95.5%) White British, 5 (3.6%) South Asian and 1 (0.7%) Other ethnicities. Apparently healthy adults comprise 163 (54.9%) White British, 117 (39.4%) South Asian and 17 (5.7%) other ethnicities. Other ethnicities are Black African (n = 1), Black Caribbean (n = 2), Other White (n = 2), Other (n = 6), and Mixed White Asian (n = 7).

For the COPD patients, 115 (82.7%) were recruited through General Practice, 12 (8.6%) through an existing research contact database, 3 (2.2%) through word of mouth, 4 (2.9%) through leaflet/poster distribution and 4 (2.9%) through other recruitment methods (e.g. newspaper advert). Of the apparently healthy adults 59 (n = 19.9%) were recruited through leaflet/poster distribution, 59 (19.9%) through University Hospitals of Leicester intranet adverts, 79 (26.6%) through word of mouth, 37 (12.5%) through Kohinoor Radio and 60 (20.2%) through other recruitment sources (e.g. community health events).

All data were collected by trained researchers. Participants were asked to attend the Respiratory Biomedical Research Unit, Glenfield Hospital, Leicestershire, UK for a one-off appointment of approximately 2–3 hours. Written informed consent was obtained from all participants before measures began. Participants were fully reimbursed for their travel and parking as part of their involvement in the study.

Anthropometrics: Height was measured using a portable stadiometer (SECA, 213). Weight and percentage body fat were obtained using body composition scales (Tanita MC780MA). Waist circumference was measured around the mid-point between the lowest rib and iliac crest [1]; taken twice using a tape measure with a third effort. The force produced was visible to the researcher and confirmed by the researcher.

Standing grip strength: Upper body skeletal muscle assessment was conducted using a hand-held dynamometer (Takeii analogue dynamometer, Niigata, Japan). Participants sat in a purpose-built chair with an inextensible strap connecting the ankle of their dominant leg to their knee, with their elbow extended down by their side [5]. Participants performed three sustained maximal isometric quadriceps contractions with the strain gauge being reset between efforts. The force produced was visible to the researcher who provided positive feedback and vigorous encouragement. There was a rest period of 30–60 seconds between each effort.

Standing grip strength: Upper body skeletal muscle assessment was conducted using a hand-held dynamometer (Takeii analogue dynamometer, Niigata, Japan). Assessed on both dominant and non-dominant hands, three measures on each hand were conducted with a brief pause between measurements. Participants were asked to squeeze the dynamometer with as much force as possible, with their elbow extended down by their side [5].

Objectively Measured Physical Activity: Physical activity and sedentary time were collected using the ActiGraph wGT3X-BT accelerometer (ActiGraph, Pensacola, USA). Worn on the non-dominant wrist (non-writing hand), monitors were worn continuously except for water-based activities at a sample rate of 100 Hz. Deployed in delay mode on day zero, data capture commenced on day one at 00:00 hrs with a seven day stop time indicated. Each accelerometer was returned via mail after seven full days of wear. Monitors were initialised and downloaded using ActiLife software (ActiGraph, Pensacola, USA) version 6.10.1. All pertinent information related to the accelerometer portion of the study is described in Table 1.
Blood pressure: Blood pressure (Omron 705IT) was taken after a minimum of 10 minutes sitting at rest. Participants were asked to remain seated whilst the researcher placed a blood pressure cuff around the upper right arm (brachial artery) after measuring the upper arm to determine the appropriate cuff size. Three measurements were taken, each separated by one minute.

Point-of-care-measures: Point of care systems for the fast, non-invasive assessment of cardio-metabolic and coronary arterial disease are becoming increasingly important for effective screening. Arterial stiffness was measured using an infra-red photo-plethysmography sensor (PulseTrace PCA2, CareFusion) with the sensor placed upon participants' fingertip for 30–60 seconds. Advanced Glycation Endproducts were measured using a skin autofluorescence device (AGE reader, Diagnoptics Technologies); three measures were conducted taking a total of three minutes.

Questionnaires: Demographics, comorbidities, general health and smoking history were collected using sections from the Health Survey for England 2008 and 2010 and UK Biobank questionnaires. Childhood deprivation and family history questionnaires were used to obtain information regarding early life and surrogate hereditary risk markers for respiratory disease and other chronic conditions in later life. The EuroQol (EQ-5D-5L) was answered by participants to assess their perceived health status [6]. The Functional Assessment of Chronic Illness Therapy—Fatigue (FACIT-F) [7] was completed to examine perceived physical, social, emotional and functional well-being. Pulmonary Rehabilitation Adapted Index of Self-Efficacy (PRAISE) [8] was used to examine self-efficacy to pulmonary rehabilitation in diagnosed COPD patients. The COPD Assessment Test (CAT) and Modified Medical Research Council (mMRC) questionnaires were used to examine perceived symptoms severity. The PRAISE and CAT were only completed by diagnosed COPD patients. Physical activity was recalled using a modified version of the short form International Physical Activity Questionnaire (IPAQ) [9] and self-reported weekday and weekend domain-specific sitting time was recalled using the Marshall Sitting Time Survey [10]. Lifetime activity history (frequency and context) was ascertained using a sport inventory checklist across age groups (<18, 18–29, 30–39 and 40–75 years).

Sampling strategy
The PhARaoH sample is comprised of patients with a General Practitioner diagnosis of COPD recruited from primary care and White British and South Asian British adults with no current diagnosis of COPD all residing within Leicestershire and Rutland, United Kingdom.

Quality Control
Data entry was conducted by a trained team of six personnel under the supervision of three supervisors through REDCap (http://projectredcap.org/). The data were 100% double data entered with conflicting entries identified using the REDCap data comparison function and resolved by an independent adjudicator against the source data.

Constraints
N/A

Privacy
All study participants have been guaranteed anonymity therefore identifiable information will not be included in any available research datasets. Researchers wishing to access the data must abide by the terms of usage which forbids any attempt to identify an individual.

Ethics
Ethical approval for PhARaoH was sought from the NHS Research Ethics Committee (REC) system in England. NHS RECs are appointed by the Strategic Health Authorities in England and safeguard the rights, safety, dignity and well-being of research participants. Applications for research are reviewed and an opinion provided about whether the proposed participant involvement and research is considered ethical. PhARaoH received ethical approval from NHS REC East Midlands Nottingham:2 (13-EM-0389).
4. Dataset description

Object name
PhARaoH Study

Data type
Primary data

Ontologies
N/A

Format names and versions
SPSS and .gt3x accelerometer files

Creation dates
Data was collected between March and August 2014.

Dataset creators
Movement Insights Lab

Language
English

Programming language
N/A

Licence
PhARaoH requires new users to register and agree to the conditions of use which can be found at http://www.lboro.ac.uk/research/mi-lab/research/pharaoh/pharahconditionsofuse/. Instructions for distribution to third parties are also outlined.

Accessibility criteria
Visit the PhARaoH webpage at http://www.lboro.ac.uk/research/mi-lab/research/pharaoh/.

Repository location
Data is available upon request from Movement Insights Lab at http://www.lboro.ac.uk/research/mi-lab/research/pharah/pharahconditionsofuse/. Manuscripts are required to be sent to the PhARaoH study team before submission to peer review journals.

Publication date
Not known

5. Reuse potential

The scope of enquiry from the PhARaoH dataset is broad with data pertaining to General Practitioner diagnosed COPD patients and apparently healthy adults, comprising predominantly White British and South Asian ethnicities all with extensive health examinations. Data for participants include markers for respiratory, cardiovascular, metabolic and immunological health as well as sophisticated methodology for the assessment of physical activity and sedentary behaviour through wrist-worn accelerometry. Therefore, this dataset is of great potential value across a wide range of research disciplines.

Additional Files
The additional files for this article can be found as follows:

- Additional File 1: Appendix. http://dx.doi.org/10.5334/ohd.28.s1

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Competing Interests
The authors have no competing interests to declare.

References
Outcomes, 1: 79. DOI: https://doi.org/10.1186/1477-7525-1-79

