

## SUPPLEMENTARY MATERIAL

### Effect of vaccination on transmission of COVID-19

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## Supplementary Tables and Figures

*Supplementary table 1: Estimation of the number of cases prevented in household members by vaccinating healthcare workers as a fraction of the number of cases preventable via interrupting this route of transmission (ie those cases caused by sharing a household with a healthcare worker)*

Effect of sharing a household with a HCW		Effect of vaccination on all detectable cases		Effect of vaccination on preventable cases
Relative risk $RR_{HHD}$	Attributable fraction among the exposed $AF_{HHD} = (RR_{HHD} - 1) / RR_{HHD}$	Relative risk ( $RR_{vax}$ )	Relative risk reduction $RRR_{vax} = 1 - RR_{vax}$	Proportion of cases prevented $= RRR_{vax} / AF_{HHD}$
1.5	33.3%	0.70	30%	90%
<b>2.0*</b>	<b>50.0%</b>	<b>0.70</b>	<b>30%</b>	<b>60%</b>
2.5	60.0%	0.70	30%	50%
3.0	66.7%	0.70	30%	45%

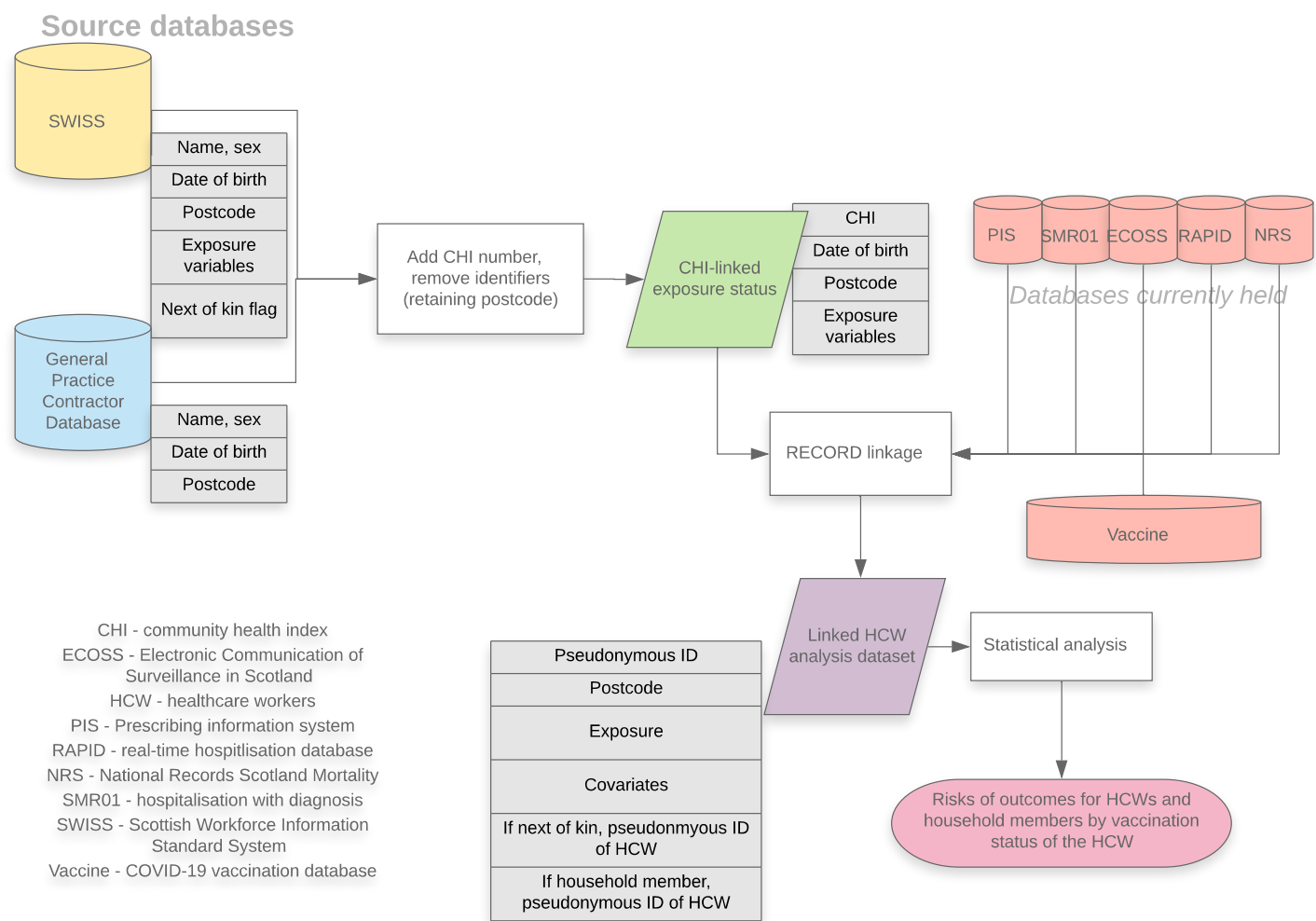
This tables illustrates shows the impact of vaccinating HCWs on transmission, taking into account that only a proportion of cases in household members could plausibly be prevented by vaccination healthcare workers, since they can also be infected via other routes.

We show the effect under different plausible estimates for the causal effect of sharing a household with a healthcare worker on the risk of developing COVID-19. The estimate in the second row ( $RR_{HHD} = 2.0$ ) is close to our own previous empirical estimates for this association (BMJ 2020;371:m3582).

To perform thus calculation we made the following assumptions:-

- Vaccination of HCWs can only reduce the risk in household members by interrupting transmission from HCWs to household members and not via other mechanisms (eg by causing a modification of behavior in household members)
- That the estimated association for vaccination is a valid causal estimate – ie no bias and no confounding

Supplementary figure 1: Overview of record linkage



**Supplementary figure 2: Participant inclusion and exclusion healthcare workers and household members**



Died prior refers to deaths on or before the 8<sup>th</sup> of December 2020

## ***Supplementary text 1 – Descriptions and sources of national databases used for individual record linkage***

### *Scottish hospitalization record from SMR01*

Comorbidities were defined from previous defined from the Scottish morbidity record 01 (SMR01) - General/Acute Inpatient & Day Case. SMR01 is an episode-based patient record relating to all inpatients and day cases discharged from non-obstetric and non-psychiatric specialties. A record is generated when a patient completes an episode of inpatient or day case care. Data collected include patient identifiable and demographic details, episode management details and general clinical information. Currently diagnoses are recorded using the ICD-10 classification and operations are recorded using the OPCS-4 classification. Further information on the national dataset and variables contained is available at <https://www.ndc.scot.nhs.uk/Data-Dictionary/SMR-Datasets//Episode-Management/SMR-Record-Type/>

### *National Records of Scotland (NRS)*

The NRS covers all deaths in Scotland with approximately 55,000 deaths registered annually. The National Records of Scotland Death Records are linked with the NHS Scotland Scottish Morbidity Database which links together NHS Scotland inpatient, mental health and cancer registry datasets with the NRS Death Records. NRS records death status, cause of death and date of death.

Further information of the NRS death registry is available at <https://www.ndc.scot.nhs.uk/National-Datasets/data.asp?SubID=13>

### *Prescribing Information System (PIS)*

The Prescribing Information System (PIS) is the definitive data source for all prescribing relating to all medicines and their costs that are prescribed and dispensed in the community in Scotland. The information is supplied by Practitioner & Counter Fraud Services Division (P&CFS) who is responsible for the processing and pricing of all prescriptions dispensed in Scotland. Primary care physicians write the vast majority of these prescriptions, with the remainder written by other authorised prescribers such as nurses and dentists. Also included in the dataset are prescriptions written in hospitals that are dispensed in the community. Note that prescriptions dispensed within hospitals are not included.

Further information on the Prescribing Information System operational in Scotland is available at <https://www.ndc.scot.nhs.uk/National-Datasets/data.asp?SubID=9>

### *National microbiology register (Electronic Communication of Surveillance in Scotland [ECOSS])*

The Scottish microbiology surveillance registry, or ‘*Electronic Communication of Surveillance in Scotland*’ (ECOSS) as it is termed by NHS National Services Scotland, was used in the present study to provide individual patient-level data on SARS-Cov-2 testing and results. ECOSS is part of NHS Scotland’s Infection Intelligence Platform (IIP),<sup>1,2</sup> which was set-up in

response to the UK's antimicrobial resistance (AMR) strategy (2013-2018) with the aim of providing “better access to and use of surveillance data”.<sup>3</sup>

Data were first collected and recorded within ECOSS in 2007. The dataset is maintained by NHS National Services Scotland on behalf of Health Protection Scotland. ECOSS is updated monthly and, as of 2017, it contained approximately 29 million records of positive microbiology laboratory specimens from across Scotland.<sup>1</sup> It provides data for numerous national clinical and research activities, audit projects and Scottish Government reports, including: the identification of cases of severe infectious disease, infectious disease outbreaks and the evaluation of longer term trends in the incidence of laboratory-reported infections; surveillance of episodes of *Clostridium difficile* infections, *Escherichia coli* bacteremia, *Staphylococcus aureus* bacteremia and surgical site infections.<sup>2</sup> NHS National Services Scotland monitors the completeness and accuracy of ECOSS data through its ‘Data Monitoring and Support Service’.<sup>1</sup> Further, NHS National Services Scotland routinely informs data users of any problems affecting the accuracy or assurance of these data.

More information on the ECOSS data system is available at <https://www.hps.scot.nhs.uk/data/>

#### *Scottish Workforce Information Standard System (SWISS)*

The Scottish Workforce Information Standard System (SWISS) is a national human resources database held by NHS Education Scotland which contains data on all directly employed staff (ie not contracted staff such as general practitioners except where they are also directly employed in some other role) working in the NHS in Scotland. It includes data for territorial health boards, and boards providing a national service. It records the job title using a nationally agreed standard as well as, for medical and dental staff the medical specialty. It also includes data on occupation grade, part-time/whole time status, and the designated service area.

More information on the SWISS database is available at <https://turasdata.nes.nhs.scot/media/2prjxbg4/2020-06-02-workforce-report.pdf>.

#### *General Practitioner Contractor Database (GPCD)*

The General Practitioner Contractor Database (GPCD) includes all contracted general practitioners working in Scotland. This includes GP partners who are independent contractors, and salaried GPs, but not locum GPs. GOs in training grades are employed centrally and so are included in SWISS.

More information on the GPCD database is available at <https://www.isdscotland.org/Health-Topics/General-Practice/Workforce-and-Practice-Populations/>.

#### *Rapid preliminary inpatient data (RAPID)*

The RAPID database has been operational since 2001 to monitor and predict emergency admissions and bed occupancy across National Health Service Boards in Scotland. Data from this database has already been used to provide information to NHS boards, healthcare workers and the public on the direct and indirect effects of the COVID-19 pandemic. These dashboards can be found at: <https://publichealthscotland.scot/our-areas-of-work/sharing-our-data-and-intelligence/coronavirus-covid-19-data/>

In 2015 the data collection was expanded to include data items on individual patient level data on age, sex, times of admission and discharge, ward significant facility, diagnosis and operation codes and information on patient discharge.

Further information on the RAPID databases can be found here:

<https://www.ndc.scot.nhs.uk/National-Datasets/data.asp?ID=1&SubID=37>

## References

1. Bennie M, Malcolm W, Marwick CA, Kavanagh K, Sneddon J, Nathwani D. Building a national Infection Intelligence Platform to improve antimicrobial stewardship and drive better patient outcomes: the Scottish experience. *J Antimicrob Chemother.* 2017 Oct 1;72(10):2938-42.
2. NHS National Services Scotland (NSS), 2014. Infection Intelligence Platform (IIP)- High level guide to IIP component datasets held by NHS National Services Scotland, <https://www.isdscotland.org/Health-Topics/Health-and-Social-Community-Care/Infection-Intelligence-Platform/Data/June-2014-Guide-to-IIP-Data.pdf> (accessed 18<sup>th</sup> March, 2020)
3. Scottish Government, 2014. Scottish Management of Antimicrobial Resistance Action Plan 2014-2018. <http://www.gov.scot/Publications/2014/07/9192> (accessed 2<sup>nd</sup> March, 2020)



***Supplement text 2: Definitions used to categorize healthcare workers and list of specialties, job roles and service areas by categorization***

These tables are also available in machine readable formats in our public-facing github repository.

***Definition of categorization for patient and non-patient facing and undetermined healthcare workers***

Definition	Description	Definition
Any staff	Any member of NHS staff.	Included in SWISS or GPCD database
Patient facing, any	Include if likely to currently be working in patient-facing role.	Specific list of AFC roles and/or medical specialties (see below)
Non-patient-facing	Any member of NHS staff likely to be in a non-patient-facing role.	Specific list of AFC roles and/or medical specialties (see below)
Undetermined	Staff where it is not possible to allocate with confidence to patient-facing or non-patient-facing roles	Any staff not in “Patient-facing, any” or “Non-patient-facing” (see below)

*Definition of categorization for patient facing roles into those at front door, exposed to aerosolized generating procedures (AGP), in intensive care and other*

Definition	Description	Definition*	Comparator(s)
Patient-facing, front-door COVID19	Include if involved in acute medical receiving of patients with possible or probable COVID19 (ie not incidental finding such as COVID19 in patient with myocardial infarction).	Specific list of AFC roles and/or medical specialties and/or designated service area (see below).	Patient-facing, other
Patient-facing, Intensive care	Intensive care medicine and anaesthetic specialties	Specific list of AFC roles and/or medical specialties and/or designated service area (see below).	Patient-facing, other
Patient-facing, Resp-oral-nasal-AGP	Include if involved in work with high risk of exposure to oral, nasal or respiratory secretions and/or aerosol generating procedures (AGP) outwith intensive care settings.	Specific list of AFC roles and/or medical specialties and/or designated service area (see below).	Patient-facing, other
Patient-facing, other	Patient-facing role but not front-door COVID or resp-oral-nasal-AGP or intensive care.	Patient-facing role but not front-door COVID or resp-oral-nasal-AGP or intensive care.	

\*Nursing staff in the General Acute Nursing and Specialist Nursing and have been further assigned to specific roles according to the recorded service area. This was done for the following territorial Health Boards, in whom there is  $\geq 95\%$  completeness for the service area variable: - NHS Ayrshire & Arran, NHS Borders, NHS Dumfries & Galloway, NHS Forth Valley, NHS Grampian, NHS Greater Glasgow & Clyde, NHS Highland, NHS Orkney and NHS Shetland. The remaining territorial boards had lower completeness for service area (ranging from 91% to  $<1\%$ )

*Definition of medical specialties into patient facing and non-patient facing roles\**

	Non patient-facing	Patient-facing**			
		Any	Front-door	Resp-oral-nasal-AGP	Intensive care
Acute Internal Medicine		Yes	Yes		
Allergy					
Anaesthetics		Yes			Yes
Audio Vestibular Medicine					
Audiological Medicine					
Blood Transfusion					
Breast Screening Service					
Cardiology		Yes			
Cardiothoracic Surgery		Yes			
Chemical Pathology					
Clinical Genetics					
Clinical Neurophysiology					
Clinical Oncology		Yes			
Clinical Pharmacology and Therapeutics		Yes			
Clinical Radiology					
Community Psychiatry		Yes			
Community Sexual And Reproductive Health		Yes			
Dermatology					
Diagnostic Neuropathology	Yes				
Emergency Medicine		Yes	Yes		
Endocrinology and Diabetes		Yes			
Endodontics		Yes		Yes	
Ent Surgery		Yes		Yes	
Family Planning Service					
Fixed & Removable Prosthodontics					
Forensic Histopathology	Yes				
Forensic Psychiatry					
Gastroenterology		Yes			
General (Internal) Medicine		Yes	Yes		
General Psychiatry		Yes			
General Surgery		Yes			
Genito-Urinary Medicine		Yes			
Geriatric Medicine		Yes	Yes		
GP Other Than Obstetrics		Yes			

Haematology					
Histopathology	Yes				
Homeopathy					
Immunology					
Infectious Diseases		Yes	Yes		
Intensive Care Medicine		Yes			Yes
Medical Microbiology And Virology					
Medical Oncology		Yes			
Medical Ophthalmology		Yes			
Microbiology					
Neurology		Yes			
Neurosurgery		Yes			
Nuclear Medicine					
Obstetrics And Gynaecology		Yes			
Occupational Medicine		Yes			
Old Age Psychiatry		Yes			
Ophthalmology		Yes			
Oral And Maxillofacial Surgery		Yes		Yes	
Oral And Maxillofacial Pathology	Yes				
Oral Medicine		Yes		Yes	
Oral Microbiology					
Oral Pathology					
Oral Surgery		Yes		Yes	
Orthodontics		Yes		Yes	
Otolaryngology		Yes		Yes	
Pain Management					
Palliative Medicine					
Plastic Surgery		Yes			
Psychiatry Of Learning Disability					
Psychotherapy					
Public Health Medicine	Yes				
Rehabilitation Medicine		Yes			
Renal Medicine		Yes			
Respiratory Medicine		Yes		Yes	
Restorative Dentistry					
Rheumatology		Yes			
Special Care Dentistry		Yes		Yes	
Surgical Dentistry		Yes		Yes	
Trauma And Orthopaedic Surgery		Yes			
Urology		Yes			
Vascular Surgery		Yes			
Virology					

There are two specialty fields in the SWISS database. These are “specialty” with around 85% completeness, and “second specialty” with lower completeness. We added data from TURAS

People (which holds data on doctors in training roles) to increase the completeness to approximately 98%.

*\* Specialities unable to be categorized into patient facing or non-patient facing roles were categorized into undetermined.*

*\*\*Patient facing medical specialties were categorized into front door, specialties exposed to aerosolized generating procedures and intensive care. Remaining specialties were categorized into 'other'*

*Definition of nursing and midwifery, allied health professionals and support services into patient facing and non-patient facing roles\**

Job Family	Job Sub Family	Non patient-facing	Patient facing**			
			Any	Front-door	Resp-oral-nasal-AGP	Intensive care
ADMINISTRATIVE SERVICES	FINANCE	Yes				
ADMINISTRATIVE SERVICES	HUMAN RESOURCES	Yes				
ADMINISTRATIVE SERVICES	INFORMATION SYSTEMS/TECHNOLOGY	Yes				
ADMINISTRATIVE SERVICES	NA	Yes				
ADMINISTRATIVE SERVICES	NHS24 CALL HANDLER	Yes				
ADMINISTRATIVE SERVICES	OFFICE SERVICES	Yes				
ADMINISTRATIVE SERVICES	PATIENT SERVICES	Yes				
ALLIED HEALTH PROFESSION	AHP TRAINING/ADMINISTRATION	Yes				
ALLIED HEALTH PROFESSION	AMBULANCE PARAMEDIC		Yes	Yes		
ALLIED HEALTH PROFESSION	ARTS THERAPIES					
ALLIED HEALTH PROFESSION	DIAGNOSTIC RADIOGRAPHY		Yes			
ALLIED HEALTH PROFESSION	DIETETICS					
ALLIED HEALTH PROFESSION	GENERIC THERAPIES					
ALLIED HEALTH PROFESSION	OCCUPATIONAL THERAPY		Yes			
ALLIED HEALTH PROFESSION	ORTHOPTICS					
ALLIED HEALTH PROFESSION	ORTHOTICS		Yes			
ALLIED HEALTH PROFESSION	PHYSIOTHERAPY		Yes		Yes	
ALLIED HEALTH PROFESSION	PODIATRY		Yes			
ALLIED HEALTH PROFESSION	PROSTHETICS					
ALLIED HEALTH PROFESSION	SPEECH AND LANGUAGE THERAPY		Yes			
ALLIED HEALTH PROFESSION	THERAPEUTIC RADIOGRAPHY		Yes	Yes		

AMBULANCE SERVICES	AMBULANCE CARE ASSISTANT		Yes	Yes		
AMBULANCE SERVICES	AMBULANCE TECHNICIAN		Yes	Yes		
AMBULANCE SERVICES	DRIVER		Yes	Yes		
AMBULANCE SERVICES	EMDC OPERATIVE	Yes				
AMBULANCE SERVICES	OPERATIONAL MANAGER	Yes				
AMBULANCE SERVICES	PTS DAY CONTROL	Yes				
EMERGENCY SERVICES	AMBULANCE AUXILIARY		Yes	Yes		
EMERGENCY SERVICES	AMBULANCE CARE ASSISTANT		Yes	Yes		
EMERGENCY SERVICES	AMBULANCE PARAMEDIC		Yes	Yes		
EMERGENCY SERVICES	AMBULANCE TECHNICIAN		Yes	Yes		
EMERGENCY SERVICES	DRIVER		Yes	Yes		
EMERGENCY SERVICES	EMDC OPERATIVE	Yes				
EMERGENCY SERVICES	OPERATIONAL MANAGER	Yes				
EMERGENCY SERVICES	PTS DAY CONTROL					
HEALTHCARE SCIENCES	BIOMEDICAL SCIENCES LIFE					
HEALTHCARE SCIENCES	CLIN PHOTO/ILLUSTRATE PHYSICAL					
HEALTHCARE SCIENCES	CLINICAL PERFUSION PHYSIOLOGY					
HEALTHCARE SCIENCES	CLINICAL PHYSIOLOGY					
HEALTHCARE SCIENCES	CLINICAL SCIENCES LIFE					
HEALTHCARE SCIENCES	CLINICAL SCIENCES PHYSICAL					
HEALTHCARE SCIENCES	CLINICAL SCIENCES PHYSIOLOGY					
HEALTHCARE SCIENCES	CLINICAL TECHNOLOGY LIFE					
HEALTHCARE SCIENCES	CLINICAL TECHNOLOGY PHYSICAL					
HEALTHCARE SCIENCES	MAXILLOFACIAL PROS PHYSICAL					
HEALTHCARE SCIENCES	NA					
HEALTHCARE SCIENCES	STERILE SERVICES LIFE					
MEDICAL AND DENTAL SUPPORT	DENTAL NURSING		Yes		Yes	

MEDICAL AND DENTAL SUPPORT	DENTAL TECHNOLOGY		Yes		Yes	
MEDICAL AND DENTAL SUPPORT	OPERATING DEPARTMENT		Yes			
MEDICAL AND DENTAL SUPPORT	ORAL HEALTH		Yes		Yes	
MEDICAL AND DENTAL SUPPORT	PHYSICIANS ASSISTANT					
MEDICAL AND DENTAL SUPPORT	THEATRE SERVICES		Yes			
MEDICAL SUPPORT	OPERATING DEPARTMENT		Yes			
MEDICAL SUPPORT	PHYSICIANS ASSISTANT		Yes			
MEDICAL SUPPORT	THEATRE SERVICES		Yes			
NURSING AND MIDWIFERY	COMMUNITY CHILDREN'S NURSING					
NURSING AND MIDWIFERY	MIDWIFERY DIRECT CC		Yes			
NURSING AND MIDWIFERY	MIDWIFERY INDIRECT CC		Yes			
NURSING AND MIDWIFERY	NA					
NURSING AND MIDWIFERY	NEONATAL MIDWIFERY CC		Yes			
NURSING AND MIDWIFERY	NEONATAL MIDWIFERY DIRECT CC		Yes			
NURSING AND MIDWIFERY	NEONATAL MIDWIFERY INDIRECT CC		Yes			
NURSING AND MIDWIFERY	NEONATAL NURSING DIRECT CC		Yes			
NURSING AND MIDWIFERY	NEONATAL NURSING INDIRECT CC		Yes			
NURSING AND MIDWIFERY	NHS 24 NURSING	Yes				
NURSING AND MIDWIFERY	NURSING TRAINING/ADMIN/MGT					
NURSING AND MIDWIFERY	PAEDIATRIC NURSING		Yes	Yes		
NURSING AND MIDWIFERY	PRACTICE NURSING		Yes			
NURSING AND MIDWIFERY	PUBLIC HEALTH NURSING					
NURSING AND MIDWIFERY	SCHOOL NURSING					
NURSING AND MIDWIFERY	SEXUAL AND REPRODUCTIVE HEALTH					
NURSING AND MIDWIFERY	SPECIALIST NURSING		Yes			
NURSING AND MIDWIFERY	STAFF NURSERY					
NURSING AND MIDWIFERY	TREATMENT ROOM NURSING		Yes			



NURSING AND MIDWIFERY	BANK NURSING		Yes			
NURSING AND MIDWIFERY	BTS NURSING		Yes	Yes		
NURSING AND MIDWIFERY	CARE OF THE ELDERLY NURSING		Yes	Yes		
NURSING AND MIDWIFERY	COMMUNITY GENERAL NURSING		Yes			
NURSING AND MIDWIFERY	DISTRICT NURSING		Yes			
NURSING AND MIDWIFERY	FAMILY PLANNING NURSING					
NURSING AND MIDWIFERY	GENERAL ACUTE NURSING		Yes	Yes		
NURSING AND MIDWIFERY	HEALTH VISITOR NURSING					
NURSING AND MIDWIFERY	LEARNING DISABILITIES NURSING		Yes			
NURSING AND MIDWIFERY	MENTAL HEALTH NURSING		Yes			
NURSING AND MIDWIFERY	MIDWIFERY		Yes			
OTHER THERAPEUTIC	GENETIC COUNSELLING					
OTHER THERAPEUTIC	NA					
OTHER THERAPEUTIC	OPTOMETRY					
OTHER THERAPEUTIC	PHARMACY					
OTHER THERAPEUTIC	PHARMACY TECHNICIANS	Yes				
OTHER THERAPEUTIC	PLAY SPECIALIST		Yes			
OTHER THERAPEUTIC	PSYCHOLOGY					
PERSONAL AND SOCIAL CARE	CARE AT HOME		Yes			
PERSONAL AND SOCIAL CARE	HEALTH PROMOTION					
PERSONAL AND SOCIAL CARE	HOSPITAL CHAPLAINCY					
PERSONAL AND SOCIAL CARE	RESIDENTIAL / DAY CARE		Yes			
PERSONAL AND SOCIAL CARE	SOCIAL WORK					
SENIOR MANAGERS	NA	Yes				
SUPPORT SERVICES	CATERING SERVICES					
SUPPORT SERVICES	DOMESTIC SERVICES					
SUPPORT SERVICES	ESTATES					

SUPPORT SERVICES	GENERAL SERVICES					
SUPPORT SERVICES	GROUNDS SERVICES					
SUPPORT SERVICES	HOTEL SERVICES					
SUPPORT SERVICES	LAUNDRY/LINEN SERVICES					
SUPPORT SERVICES	NA					
SUPPORT SERVICES	PORTERING SERVICES		Yes			
SUPPORT SERVICES	SECURITY SERVICES					
SUPPORT SERVICES	STERILE SERVICES					
SUPPORT SERVICES	STORES SERVICES					
SUPPORT SERVICES	TRANSPORT SERVICES					
UNALLOCATED / NOT KNOWN	NA					
UNALLOCATED / NOT KNOWN	NOT KNOWN					

*\* Roles unable to be categorized into patient facing or non-patient facing were categorized into undetermined.*

*\*\*Patient facing roles were categorized into front door, specialties exposed to aerosolized generating procedures and intensive care. Remaining specialties were categorized into 'other'*

#### *Definition of relevant service areas*

	Front –door	Respiratory-oro-aerosol – generating procedures	Intensive care
Accident and Emergency	Yes		
Anaesthetics			Yes
Ear Nose & Throat		Yes	
Endocrinology & Diabetes			
Gastroenterology			
General Medicine	Yes		
Infectious Diseases	Yes		
Intensive Care			Yes
Neonatal/SCBU			Yes
Oral & Maxillofacial		Yes	
Respiratory		Yes	
Restorative Dentistry		Yes	

Rheumatology			
Surgical Dentistry		Yes	

### ***Supplement text 3: Comorbidity definitions***

The following ICD-10 definitions were used to define each comorbidity (British National Formulary definitions are included in our public github repository).

#### **CIRCULATORY DISORDERS**

Ischaemic heart disease	I20-I25
Other heart disease	I00-102 I05-I09 I10-I15 I26-I28 I30-I52
Cerebrovascular Disease	I60-I69 G45 = Transient cerebral ischaemic attacks G46 = Vascular syndromes of brain in cerebrovascular diseases
Other circulatory system diseases	I70-I79 Diseases of arteries, arterioles and capillaries  I80-I89 Diseases of veins, lymphatic vessels and lymph nodes, not elsewhere classified I95-I99 Other and unspecified disorders of the circulatory system Z958 presence of vascular implants and grafts Z959 presence of vascular implants and grafts NOS
Neurological diseases except inflammatory	
Epilepsy	G40-G47 Episodic and paroxysmal disorders
Mono and polyneuropathies	G50-G59 Nerve, nerve root and plexus disorders  G60-G64 Polyneuropathies and other disorders of the peripheral nervous system
Other neurological conditions	G10-G14 Systemic atrophies primarily affecting the central nervous system G20-G26 Extraparamidal and movement disorders G30-G32 Other degenerative diseases of the nervous system G35-G37 Demyelinating diseases of the central nervous system G70-G73 Diseases of myoneural junction and muscle G80-G83 Cerebral palsy and other paralytic syndromes G90-G99 Other disorders of the nervous system
Respiratory diseases	
Acute respiratory infections	J00-J06 Acute upper respiratory infections  J09-J18 Influenza and pneumonia J20-J22 Other acute lower respiratory infections
Asthma	J45 Asthma

	J46 Status asthmaticus
Other Chronic lower respiratory disease	J40 Bronchitis, not specified as acute or chronic J41 Simple and mucopurulent chronic bronchitis J42 Unspecified chronic bronchitis J43 Emphysema J44 Other chronic obstructive pulmonary disease J47 Bronchiectasis J60-J70 Lung diseases due to external agents J80-J84 Other respiratory diseases principally affecting the interstitium J85-J86 Suppurative and necrotic conditions of lower respiratory tract J90-J94 Other diseases of pleura J95-J99 Other diseases of the respiratory system G473 Sleep apnoea
Tuberculosis	A15 Respiratory tuberculosis, bacteriologically and histologically confirmed A16 Respiratory tuberculosis, not confirmed bacteriologically or histologically A17 Tuberculosis of nervous system A18 Tuberculosis of other organs A19 Miliary tuberculosis
Connective tissue diseases	
Connective tissue disorder	M050 Felty syndrome  M051 Rheumatoid lung disease M052 Rheumatoid vasculitis M053 Rheumatoid arthritis with involvement of other organs and systems M058 Other seropositive rheumatoid arthritis M059 Seropositive rheumatoid arthritis, unspecified M060 Seronegative rheumatoid arthritis M063 Rheumatoid nodule M069 Rheumatoid arthritis, unspecified M32 Systemic lupus erythematosus M332 Polymyositis M353 Polymyalgia rheumatica M34 Systemic sclerosis
Decompensated liver disease	C22.0 hepatocellular carcinoma  I85.0 Oesophageal varices I98.3 Oesophageal varices K70.4 Alcoholic hepatic failure K72.0 Acute and subacute failure of the liver

	K72.1 Chronic hepatic failure
	K72.9 Hepatic coma
	K76.7 hepatorenal syndrome
	R18 Ascites
Kidney disease	
Advanced Chronic kidney disease or RRT	N18.3 Chronic kidney disease stage 3
	N18.4 Chronic kidney disease stage 4
	N18.5 Chronic kidney disease stage 5
	Z490 Care involving dialysis
	Z491 Care involving dialysis
	Z492 Care involving dialysis
	Z940 Kidney transplant status
	Z992 Dependence on renal dialysis
Other chronic kidney disease	N00-N08 Glomerular diseases
	N10-N16 Renal Tubulo-interstitial disease
	N18.1 Chronic kidney disease stage 1
	N18.2 Chronic kidney disease stage 2
	N18.9 Chronic kidney disease unspecified
Diabetes	
	E10 Type 1 diabetes mellitus
	E11 Type 2 diabetes mellitus
	E12 Malnutrition-related diabetes mellitus
	E13 Other specified diabetes mellitus
	E14 Unspecified diabetes mellitus
Malignant neoplasms	C00-C97
Lung cancers	C34 Malignant neoplasm of bronchus and lung
Blood cancers	C81-C96 Malignant neoplasms, stated or presumed to be primary, of lymphoid, haematopoietic and related tissue
Other cancers	Everything else in C00-97 except c34 and C81-C96
Immunological disease	
HIV	B20 –B23 Human immunodeficiency virus [HIV] disease
Certain disorders involving the immune system	D80-D89 Certain disorders involving the immune system
Sickle cell disease	
SCD	D57 Sickle-cell disorders
Cystic fibrosis	E84 Cystic fibrosis
Organ transplantation other than kidney	