UK Health Security Agency Public Health Microbiology Division

Virus Reference Department User Manual

Version 18, July 2023, Q-Pulse VW0405

Contents

Foreword

The UK Health Security Agency (UKHSA) Virus Reference Department (VRD) is a national and international reference centre for a wide range of virus infections. We receive clinical samples and viral isolates from public health departments, National Health Service (NHS) and commercial laboratories across the UK and internationally for specialist testing, virus characterisation and susceptibility testing.

VRD's workflows changed dramatically during 2020 to 2021 as part of the coronavirus (COVID-19) response. The department rapidly introduced and led COVID-19 molecular and serological testing, sequencing and virus culture delivered by teams drawn from across the Colindale site. In 2020 to 2021, we performed over 754,000 tests on over 382,500 COVID-19 samples. In addition, VRD maintained its non-COVID-19 reference services, albeit with reduced numbers of referred specimens, and delivered almost 110,000 non-COVID tests on 63,000 specimens. These workloads reflect the value of VRD services to clinicians, microbiologists, consultants in communicable disease control, and UKHSA Surveillance colleagues, and to the nation during the pandemic.

The department is made up of 8 units, including the:

- Respiratory Virus Unit, which includes the UK World Health Organization (WHO) National Influenza Laboratory
- Enteric Virus Unit
- Polio Reference Services, which includes the National Polio Laboratory
- Immunisation and Diagnosis Unit, which includes the WHO Global specialised Measles and Rubella Reference Laboratory
- Antiviral Unit, which includes a WHO Global Specialised human immunodeficiency virus (HIV) Drug Resistance Laboratory
- the Clinical Services Unit, which is listed as a WHO Pre-qualification evaluation laboratory

VRD also houses the Blood Borne Virus Unit with NHS Blood and Transplant, providing reference services for hepatitis viruses and other risks to blood supply, and the Human Papillomavirus Unit (HPV Unit) which carries out surveillance and vaccine studies. The department has links with the High Containment Microbiology (HCM) department, which houses a containment level 4 (CL4) laboratory. Members of VRD staff sit on a number of national and international panels and provide advice to the WHO, FSA, Department of Health and Social Care, the European Union and European Centre for Disease Prevention and Control (ECDC), and provide assistance and advice in national and international outbreak investigations.

The main focus of the laboratory's work is to provide national reference and specialist diagnostic services. The expertise developed through the provision of this reference service supports a substantial applied research and development programme. We also provide support

for outbreak investigations in the UK and internationally. VRD was involved in the development and evaluation of oral fluid and dried blood spot testing for HIV, hepatitis viruses, measles, mumps and rubella. The resultant national diagnostic service offered to primary care plays an important role in monitoring vaccine programmes and infection in hard-to-reach groups. The WHO Measles and Rubella laboratory has established 2 web-reportable sequence databases which are used by the WHO laboratory network. The WHO National Influenza Laboratory has been involved in establishing the national influenza diagnostic network and has played a key role in the investigation of avian influenza outbreaks and influenza pandemics, including the development of diagnostic tests and vaccine evaluation. Currently the focus is on responding to emerging novel viruses, such as SARS-CoV-2, MERS and Zika, and in a wide-ranging programme assessing the value of whole genome sequencing for public health virology.

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Amendment history

Version number	Date	Sections affected	Pages affected
14	August 2018	Key factors affecting tests. Services available. Polio Reference Service information. Contact details.	All
15	November 2019	Terms and conditions of business. Forensic test information. Key information about tests. Changes to C.trachnomatis/LGV. Polyomavirus and syphilis testing. Quality assurance information. Compliance with HTA. Contact details.	5, 9, 10 to 12, 21, 24, 26, 29, 32, 33 to 40
16	May 2021	Significant update of all sections.	All
17	August 2022	Updates to all sections following transition from PHE to UKHSA	All
18	July 2023	Addition of Public Health Microbiology Division, update A-Z listing and staff list	All

Establishment of service agreement

Each request accepted by the laboratory for examination is considered to be an agreement under UKHSA terms and conditions of business. Specific requests for service level agreements or contracts should be made to business@ukhsa.gov.uk.

Key personnel and contact details

Name	Designation	Email	Telephone
Neil Woodford	Deputy Director, Public Health Microbiology Division	neil.woodford@ukhsa.gov.uk	020 8327 6511
Hemanti Patel	Head of Laboratory Scientific Services	hemanti.patel@ukhsa.gov.uk	020 8327 7705
Sunita Gurung	Interim Head of Business and Commercial Services (interim)	Sunita.Gurung@ukhsa.gov.uk	020 8327 6758

Full contact details for VRD staff members may be found from page 41 onwards.

UKHSA Public Health Microbiology switchboard: 020 8200 4400

VRD General Office:
Telephone: 020 83277887 staffed 9 am to 5 pm Monday to Friday
email: vrdqueries@ukhsa.gov.uk

DX address
UKHSA Colindale
Bacteriology
DX 6530002

Postal address
UK Health Security Agency
Bacteriology Reference Department
61 Colindale Avenue
London NW9 5EQ

How to obtain services

Hours of service

The Department is open from 9 am to 5 pm, Monday to Friday. Telephone enquiries via the VRD general office are available from 9 am to 5 pm, Monday to Friday. No routine services are available outside these hours. The Department is closed on public holidays.

A 24 hour on-call service for the urgent diagnosis of viral haemorrhagic fevers and smallpox is available. Contact the Colindale Duty Doctor on telephone 020 8200 4400.

Services to the public

VRD does not offer diagnostic services to members of the public except via a registered medical practitioner. Results can only be issued to the requesting physician or medical unit and will not be given to patients directly under any circumstance. We reserve the right to check the authenticity of callers in order to protect the confidentiality of patients' personal data.

There are no clinical facilities at UKHSA Colindale and we are unable to see patients or give telephone medical advice directly to members of the public.

Specimen submission guidelines

Specimens

All specimens **must** be labelled with the following.

1. Surname, forename or other unique patient identifier
2. Date of birth
3. Sender's sample number
4. Date of collection of specimen

Printed specimen labels should be used wherever possible. Please note that unlabelled specimens cannot be processed and may be discarded.

Request forms

VRD specific request forms are available from the UKHSA Virus reference department (VRD) webpages. Certain forms are available via hyperlinks from the A to Z list of tests available pages. Guidelines for the completion of forms may be also be found on the UKHSA Virus reference department (VRD) webpages.

Users are strongly recommeneded to use these forms for all requests and to complete them with the details below. Please check the website using the link above for the most up to date request form prior to completing the form. Failure to use these forms may lead to delays in specimen turnaround time.

Forms **must** match the information on the sample. Any specimens where there is a mismatch between data on the sample and on the request form may be rejected. Forms **must** include the following information.

Tests required:

1. Specimen type and site where appropriate.
2. Hazard group, if known or suspected to contain Hazard Group 3 pathogens (special arrangements apply for specimens suspected of harbouring hazard group 4 agents. See page 33).
3. Date of collection.
4. Sender's sample number.
5. Contact information of requester (vital for urgent requests).

Request Forms should also have:

1. Date of dispatch
2. Sex
3. Relevant clinical information including details of any antiviral therapy
4. Date of onset
5. Vaccination history
6. NHS number
7. Reference to any previous VRD reports (please give VRD laboratory number if known)
8. For investigations of maternal transmission, please identify the linked mother or child.

Please complete the forms in **black ink** (not red or any other colour) as forms are scanned electronically.

Failure to comply with our specimen submission guidelines may lead to specimen rejection and/or delay of reports.

Specimen quarantine

Failure to complete relevant information on the request form may lead to the specimen being placed in quarantine on arrival at UKHSA, and subsequent delays in processing whilst further information is sought from the referring laboratory. Please ensure all relevant clinical information is completed on the form(s).

Specimens may also be quarantined if there is evidence the patient has visited an endemic area for high-risk pathogens, or an area where there is known to be a recent or current outbreak of a high-risk pathogen.

In the event of a specimen being quarantined, the referring laboratory will be contacted to provide further information. Where no response is received and hence no testing is performed, the samples will be kept for a minimum of one month, after which they may be discarded.

Forensic and medicolegal specimens

The department has capabilities to test medicolegal specimens and certain types of forensic specimens. However, whilst the assays performed are accredited under ISO15189:2012 for diagnostic purposes, the department is **not** accredited for performing these tests for forensic work where the results of the sample will go into the criminal justice system.

Due to the legal requirements pertaining to these types of specimens, they will **only** be processed if the department has been contacted in advance and if all paperwork (including the chain of evidence form) is correctly completed. This will enable the department to ensure continuity of evidence throughout testing.

All requests for forensic tests must be discussed with the relevant units prior to sending the specimen to the laboratory.

Specimen transportation

Specimens sent by post or by courier must be in a sealed container, surrounded by sufficient absorbent packing material to take up any leakage in the event of damage during transit, sealed in a plastic bag and placed in an approved outer container which meets current postal or other transport regulations. Contact the departmental safety manager (Lauren Harwin, (lauren.harwin@ukhsa.gov.uk) on 020 8327 7603) or the Virology Specimen Reception manager (Fiona Clode (Fiona.clode@ukhsa.gov.uk) on 020 8327 7129 or 020 8327 6063) for further information.

Special arrangements are required for the collection and transportation of specimens involving suspected hazard group 4 agents. See page 33 for further details.

UKHSA follows the Guidance on regulations for the transport of infectious substances 2021-2022, published by the WHO. Specimens sent to VRD laboratories must meet the criteria in these guidelines. Samples which are not packaged appropriately may not be processed.

Arrangements must be made by referring laboratories to ensure that time and temperature requirements (detailed under Key factors affecting tests, below) for sample transportation are

maintained. Failure to achieve this may compromise sample integrity and the validity of test results. Samples which do not meet the sample acceptance criteria may not be processed. Samples which are dispatched at ambient temperature (10°C to 25°C) must have a transit time of no more than 72 hours. If the date of receipt is greater than 72 hours from the date of dispatch, the referring laboratory will be informed and the specimens may not be processed.

Please do not to include confidential letters within specimen boxes which are not related to the specimens. These should be sent separately and should be clearly marked for the attention of the addressee only.

Key factors affecting tests

Serology tests

Samples which are highly haemolysed, hyperlipaemic or which contain microbial contamination should not be sent. Heat inactivated samples may give rise to erroneous results in a number of assays and should not be sent – please contact the relevant unit prior to sending the specimen if no other sample is available. Serum or plasma samples should be stored at 2 to 8°C for no longer than 7 days – if stored for a longer period of time, they should be frozen at minus 20°C or lower. Repeated freeze-thaw cycles should be avoided, as this may degrade the analyte sought and cause inaccurate quantitation or false negative results. If sending samples at ambient temperature, transit time must be less than 72 hours. Please note that while post-mortem samples may be accepted, only a limited number of tests available from VRD laboratories have been evaluated for use with samples from cadavers.

Certain assays (for example, polyomavirus serology assays, avian Influenza antibody testing) require serum only – plasma samples are not suitable. Specific requirements are listed from page 16 onwards. When sending paired sera, please ensure samples are taken at least 14 days apart.

Molecular tests

Ethylenediamine tetraacetic acid (EDTA) plasma is preferable to serum, as degradation of nucleic acid can occur in serum or clotted samples, which may result in under-reporting of viral load. Serum or plasma should be separated by centrifugation within 4 hours of collection. Samples should be sent as soon as possible, or frozen at minus 20°C or lower. Repeated freeze-thaw cycles (greater than 3 times) may result in under-quantification and should be avoided. Samples which are highly haemolysed, hyperlipaemic or which contain gross microbial contamination should not be sent; where this is unavoidable (for example, haemolysed samples from post-mortem specimens) the laboratory should be contacted in advance for advice. Do not send dry swabs, charcoal swabs, swabs in bacterial transport gel or swabs with wooden shafts, as all are unsuitable for molecular testing. Heparinised samples, or samples from patients who have received heparin, may give erroneous results and must not be sent – please contact laboratory for advice.

If the original specimen is not available, cDNA may be sent as an alternative – please contact the relevant unit prior to sending specimen. Details of the extraction and cDNA generation method used must be provided in such cases. Please note that unprotected RNA samples will degrade rapidly and are not suitable.

Details of any antiviral therapy should be given wherever possible.

Whole (unseparated) blood samples

Certain tests - for example, HIV and Human T-cell lymphotropic virus (HTLV) proviral DNA - require whole unseparated blood collected on EDTA. Samples should be sent to the laboratory as soon as possible after collection. Where possible, whole blood samples should not be sent over a weekend. Samples over 3 days old may not be suitable for testing.

Samples for poliovirus isolation testing

Faecal samples should be unadulterated/unprocessed. Ideally two samples collected 24 to 48 hours apart are required, with a minimum weight of 2g (preferably 8 to 10g). Samples should reach the reference laboratory within 3 days of collection; cooled or dry ice shipment is recommended, but is not essential.

CSF, oral fluid, urine and other samples

Please contact the relevant unit prior to sending these specimens, as the assays used may not have been validated for these sample types.

Samples for electron microscopy

Swabs in liquid medium are not recommended for electron microscopy examination of skin lesions. Suitable specimens are either smears of vesicle fluid dried onto a microscope slide, a piece of crust, scabs, or a biopsy or curettage of the lesion placed in a dry sterile container. Biopsy specimens are preferable for suspected orf as virions often remain cell-associated.

Tissue samples

Tissue samples received for polymerase chain reaction (PCR) testing are recommended to be sent frozen. Samples received at room temperature may give rise to unreliable results, particularly for RNA viruses. Note tissue samples that require PCR for parvovirus B19, measles, mumps or rubella testing will require additional processing time to that stated for other specimen types.

Samples for antiviral resistance testing

Tissue culture isolates are the preferred specimens for herpes simplex virus (HSV) antiviral resistance testing. Swabs in virus transport medium (VTM) will be accepted. A fresh swab in VTM sent as soon as possible after collection will increase the likelihood of successful virus isolation and/or culture, however successful isolation cannot be guaranteed. Samples in lysis

buffer may be tested for genotypic resistance but are not suitable for phenotypic resistance tests.

For HIV genotyping and/or resistance testing, plasma samples with viral loads of greater than 500 copies per ml are required.

For Hepatitis C virus (HCV) resistance testing and genotyping by whole genome sequencing, viral loads of greater than 5000 IU per ml are required. Samples for HCV genotyping with low viral loads may be tested by NS5B sequencing rather than whole genome sequencing. Details of antiviral therapy, genotype and/or subtype and viral load should be given wherever possible.

For influenza genotypic antiviral resistance testing, respiratory secretions or nose and/or throat swabs in VTM are the preferred specimens, and tissue culture isolates if available will be accepted. Details of antiviral therapy, virus type and subtype and diagnostic PCR cycle threshold (Ct) should be given wherever possible.

Samples for influenza strain typing or phenotypic antiviral resistance

Nose and/or throat swabs in VTM are the preferred specimens, and fluid from respiratory secretions or tissue culture isolates if available will be accepted. Virus isolation (in tissue culture) is required prior to influenza virus strain typing by haemagluttination inhibition (HAI). Respiratory samples sent as soon as possible after collection will increase the likelihood of successful virus isolation, however successful recovery of virus in culture cannot be guaranteed.

Samples for urgent measles testing

The VRD does not offer urgent measles testing. Please contact your local Public Health Laboratory for details on where urgent measles services are offered and the sample types needed for testing. Any samples collected and sent for local urgent testing should be in addition to routine samples sent to VRD that are required for confirming all suspected cases of measles.

Samples for SARS-CoV-2 testing (COVID-19)

Nose and/or throat swabs in VTM are the preferred specimens for SARS-CoV-2 RT-PCR. Please note that a post-mortem blood sample is unsuitable for SARS-CoV-2 RT-PCR analysis due to the presence of inhibitors. It is suggested that a more appropriate post-mortem nose and/or throat swab be taken instead for SARS-CoV-2 RT-PCR analysis.

Services available

The department undertakes tests for the infections listed on the following pages. Key factors affecting individual tests are noted against the relevant test, including minimum sample volumes where relevant.

Turnaround times are from day of receipt to issue of reports in calendar days. The times shown are the typical turnaround times achieved by the laboratory, but may be longer or shorter depending on the availability of staff and the complexity of the investigation. For example, turnaround times may be longer outside periods of seasonal outbreaks, with testing being conducted more frequently during epidemic seasons. Turnaround times may also be extended if additional testing is required, for example, when virus typing cannot be determined by a first-line test. VRD staff are committed to the fastest possible issue of reports, consistent with accuracy, on the specimens they examine.

Requests for additional tests: time limits and specimen retention

If additional laboratory testing is required on a sample previously submitted to VRD, please contact the relevant unit in the first instance. Original specimens are normally retained for at least one month (up to several years in the case of certain specimens) but further testing may not be possible due to sample volume constraints, specimen viability or other factors. The unit will be able to advise on the feasibility of using the original specimen for analysis. All requests for additional testing should be accompanied by a written request form. Please note there are no fax facilities at UKHSA Colindale.

A to Z list of tests available

Request forms may be downloaded for certain tests by clicking test names.

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
Adenoviruses (blood)				
PCR	Whole blood	Contact laboratory	Contact laboratory	BBVU
Adenoviruses (enteric)				
PCR	Faeces (<5 days post-onset)	Contact laboratory	Contact laboratory	EVU
Adenoviruses (respiratory)				
Virus detection by PCR / sequencing	Fluid from respiratory secretions, nose and throat swabs, tissue culture fluid	Contact laboratory	Contact laboratory	RVU
Astrovirus				
RT-PCR	Faeces (<5 days post-onset)	Contact laboratory	Contact laboratory	EVU
Coronavirus (seasonal)				
Virus detection by PCR / sequencing	Fluid from respiratory secretions, nose and throat swabs	Contact laboratory	Contact laboratory	RVU
Coronavirus (SARS-CoV-1)				
Contact laboratory prior to collection of samples				RVU
Coronavirus (MERS-CoV)				
Contact laboratory prior to collection of sample				RVU
Coronavirus (SARS-CoV-2)				
Surveillance and reference testing including specific studies for RT-PCR	Fluid from respiratory secretions, nose and throat swabs.	6 days	Contact laboratory	RVU

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
	Other samples such as Serum/Plasma, CSF and oral fluids by prior arrangement.			
RNA sequencing	Fluid from respiratory secretions, nose and throat swabs, RNA, lysate	Contact laboratory	Contact laboratory	RVU
Enteroviruses				
RT-PCR (by prior arrangement only)	Faeces, CSF, throat swab, respiratory tract secretions.Other samples by arrangement. Minimum volume: 200µL	Contact laboratory	Faeces: clinical samples tested weekly. For other samples, contact laboratory	EVU
Typing of referred positive samples	Faeces, CSF, throat swab, respiratory tract secretions.Other samples by arrangement. Minimum volume: 200µL	Contact laboratory	Contact laboratory	EVU
Haemophilus ducreyi				
PCR	Fresh dry swab or swab in viral transport medium is optimal, taken from genital or oral ulcer	Contact laboratory	Contact laboratory	CSU
Hepatitis A virus (HAV)				

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
RNA	Serum or plasma (300µL)	14 days	Weekly (Monday)	BBVU
Genotyping /phylogenetics	Serum or plasma (300µL)	14 days	Weekly (Monday)	BBVU
Anti-HAV IgG / IgM	Serum or plasma (200µL)	8 days	2 to 3 times weekly	CSU
Hepatitis B virus (HBV)				
HBsAg detection	Serum or plasma (300µL)	8 days	Every other working day	CSU
	Dried blood spots	15 days	Contact laboratory	BBVU
	Oral fluid	Contact laboratory	Contact laboratory	BBVU
HBsAg quantification	Serum or plasma (300µL)	8 days	Every other working day	CSU
HBsAg neutralisation	Serum or plasma (500µL)	15 days	Thursday	CSU
HBeAg	Serum or plasma (300µL)	8 days	Every other working day	CSU
Anti-HBc	Serum or plasma (300µL)	8 days	Every other working day	CSU
	Dried blood spots	15 days	Contact laboratory	BBVU

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
	Oral fluid	Contact laboratory	Contact laboratory	BBVU
Anti-HBc IgM	Serum or plasma (300µL)	8 days	Every other working day	CSU
Anti-HBs	Serum or plasma (200µL)	8 days	Every other working day	CSU
Anti-HBe	Serum or plasma (300µL)	8 days	Every other working day	CSU
DNA viral load	EDTA plasma (300µL)	8 days	Every other working day	CSU
Pre-core / BCP mutation screen	EDTA plasma (300µL)	28 days	Weekly (Thursday)	BBVU
Surface mutation screen	EDTA plasma (300µL)	28 days	Weekly (Thursday)	BBVU
Antiviral resistance	EDTA plasma (300µL)	28 days	Weekly (Thursday)	BBVU
Genotyping /phylogenetics	EDTA plasma (300µL)	28 days	Weekly (Thursday)	BBVU
Hepatitis C virus (HCV)				
Antibody confirmation	EDTA plasma (400µL)	8 days	Weekly	CSU
HCV viral load	EDTA plasma (400µL)	8 days	Twice weekly	CSU
Antibody confirmation (dried blood spots and oral fluid samples)	Dried blood spots Oral fluid	By special arrangement only. Contact lab for details	Contact laboratory	BBVU
RNA viral load	EDTA plasma (300µL)	8 days	Twice weekly	CSU

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
Qualitative RNA detection	Dried blood spots	Contact laboratory	Contact laboratory	BBVU
Genotyping (NS5B sequencing) by special arrangement only	EDTA plasma (300µL) Dried blood spots	Contact laboratory	Contact laboratory	CSU BBVU
Phylogenetics	EDTA plasma (300µL)	Contact laboratory	Contact laboratory	AVU/ BBVU
HCV whole genome sequencing (antiviral resistance and genotyping)	EDTA plasma (preferred) or serum, >1ml RNA extracts by prior arrangement only	15 days	Weekly (Friday)	AVU
Hepatitis Delta virus (HDV)				
Anti-HDV IgG	Serum or plasma (200µL)	15 days	Weekly	CSU
Anti-HDV IgM	Serum or plasma (200µL)	Contact laboratory	Contact laboratory	CSU
RNA	EDTA plasma (300µL)	28 days	Weekly (Thursday)	BBVU
Hepatitis E virus (HEV)				
Anti-HEV IgG	Serum or plasma (100µL)	8 days	3 times weekly	CSU
Anti-HEV IgM	Serum or plasma (100µL)	8 days	3 times weekly	CSU
RNA	Serum or plasma (300µL), Faeces	14 days	Weekly (Monday and Thursday)	BBVU

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
Genotyping /phylogenetics	EDTA plasma (300µL)	Contact laboratory	Contact laboratory	BBVU

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
Herpes simplex virus (HSV 1 and 2)				
Phenotypic drug resistance	Tissue culture isolate Swab in VTM. (**NB**: please see note regarding swabs on page 14)	21 days 28 days	Contact laboratory	AVU AVU
Genotypic drug resistance	Serum, plasma, CSF (200µL), swab	14 days	Contact laboratory	AVU
Intrathecal antibody testing	Paired serum and CSF (750 µL each)	Contact laboratory	Contact laboratory	IDU
HIV-1 and HIV-2				
HIV 1 / HIV-2 antibody screen / confirmation / typing	Serum or plasma (500µL) Dried blood spots Oral fluid	8 days Contact laboratory Contact laboratory	Tuesday, and Friday Contact laboratory Contact laboratory	CSU CSU CSU
HIV 1 / HIV-2 antibody typing	Serum or plasma (500µL)	8 days	Tuesday, Thursday	CSU

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
	Dried blood spots Oral fluid	Contact laboratory Contact laboratory	Contact laboratory Contact laboratory	CSU CSU
HIV-1 proviral DNA	Unseparated blood on EDTA	8 days	Twice weekly	CSU
HIV-1 p24 antigen with neutralisation	Serum or plasma (500µL)	8 days	Monday and Thursday	CSU
HIV-1 incidence testing (avidity)	Serum or plasma (200µL)	Contact laboratory	Contact laboratory	CSU
HIV-1 genotypic resistance	EDTA plasma (>1ml)	21 days	Contact laboratory	AVU
HIV-1 proviral tropism testing	Unseparated blood on EDTA	21 days	Contact laboratory	AVU
Detection of minority drug resistance mutants	EDTA plasma (>1ml)	Contact laboratory	Contact laboratory	AVU
HIV-1 sequencing and sequence comparison	EDTA plasma (>1ml)	Contact laboratory	Contact laboratory	AVU
HTLV-I/II				
HTLV antibody screen / confirmation / typing	Serum or plasma (300µL)	8 days	Screen: 2 to 3 times weekly. Confirmation and typing: weekly (Tuesday)	CSU
HTLV type-specific PCR	Unseparated blood on EDTA	Contact laboratory	Contact laboratory	CSU

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
Human herpesvirus 6 (HHV-6)				
Genotyping and confirmation of integration Note: testing performed only on known PCR positive samples	CSF, serum or plasma (150µL), whole blood (500µL)	21 days	Twice per month	IDU
Human herpesvirus 7 (HHV-7)				
PCR	CSF, serum or plasma (150µL), whole blood (500µL)	21 days	Twice per month	IDU
Human herpesvirus 8 (HHV-8)				
Quantitative DNA PCR	Unseparated blood on EDTA. Other specimens by arrangement with laboratory	15 days	Contact laboratory	CSU
Human metapneumovirus				
Virus detection by multiplex PCR	Fluid from respiratory secretions, nose and throat swabs	7 days in season (November to March)	Daily in season	RVU
Influenza				
Virus detection by multiplex PCR	Fluid from respiratory secretions, nose and throat swabs	7 days in season (November to March)	Daily in season	RVU
Strain typing HAI	Fluid from respiratory secretions, nose and throat	Consult laboratory	2 to 3 runs per week in season	RVU

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
	swabs, tissue culture fluid			
Antibody response HAI	Paired acute and convalescent sera (minimum 1ml)	Consult laboratory	Consult laboratory	RVU
Influenza virus typing and drug resistance testing by Next Generation Sequencing (NGS)	Fluid from respiratory secretions, nose and throat swabs in VTM. Respiratory sample in lysis buffer.	7 working days in season (October to March), 14 working days outside season (April to September)	Consult laboratory	RVU
Influenza (avian)				
Confirmation of regional lab H5, H7 or H9 virus detection	Respiratory sample in lysis buffer, fluid from respiratory secretions, nose and throat swabs, tissue culture fluid	24 hours	Consult laboratory	RVU
Antibody response	Paired sera (minimum 1ml)	Consult laboratory	Consult laboratory	RVU
Investigation	**Sample required**	**Target turnaround time**	**Test schedule**	**Contact unit**
Lymphogranuloma venereum (LGV)				

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
RT-PCR for the detection of LGV	Confirmed *C.trachomatis* positive clinical specimen: minimum of 500µL residual NAAT swab transport medium, or a fresh dry swab (note: swabs from men only) Note: charcoal swabs are not suitable for this test.	6 days	Twice weekly	CSU
Measles				
IgM serology for recent infection **Regarding: urgent measles testing: please see note on page 14**	Serum or plasma (100µL), oral fluid (Oracol)	4 days	3x weekly	CSU
IgG antibody status Intrathecal antibody testing	Serum (100µL) Paired serum and CSF (750µL each)	15 days Contact laboratory	Weekly Contact laboratory	IDU IDU
Investigation	**Sample required**	**Target turnaround time**	**Test schedule**	**Contact unit**
PCR	Oral fluid (Oracol), throat swabs, NPA, CSF (150µL), urine, tissue	10 days (Tissue: contact lab)	Weekly	CSU

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
Plaque reduction neutralisation assay	Serum or plasma (200µL following consultation with laboratory)	Contact laboratory	Contact laboratory	IDU
MERS-CoV				
Refer to coronavirus section on page 16. **Contact laboratory prior to collection of specimens.**				RVU
Molluscum contagiosum				
Electron microscopy	Suitable specimens are either smears of vesicle fluid dried onto a microscope slide, or a piece of crust or biopsy of a lesion placed in a dry sterile container. Please note swabs of skin lesions in liquid media are not recommended for electron microscopy.	4 days	As required	VRD General Office
Investigation	**Sample required**	**Target turnaround time**	**Test schedule**	**Contact unit**
Mumps				
IgM serology for recent infection	Serum or plasma (100µL) Oral fluid (Oracol)	10 days	Weekly	CSU
IgG antibody status	Serum or plasma (100µL)	10 days	Weekly	CSU

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
PCR	Oral fluid (Oracol), throat swabs, NPA, urine or CSF (150µL)	10 days	Weekly	CSU
Noroviruses				
RT-PCR (by prior arrangement only)	Faeces (<5 days post-onset)	Contact laboratory	Clinical samples: tested weekly	EVU
Genotyping of referred positive samples Environmental investigations	Faeces (<5 days post-onset) Contact laboratory	Contact laboratory Contact laboratory	Contact laboratory Contact laboratory	EVU EVU
Investigation	**Sample required**	**Target turnaround time**	**Test schedule**	**Contact unit**
Orf				
Electron microscopy	Biopsy specimens are preferable for suspected orf. Suitable alternative specimens are either smears of vesicle fluid dried onto a microscope slide, or a piece of crust or biopsy of the lesion placed in a dry sterile container.	4 days	As required	VRD General Office

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
	Please note swabs of skin lesions in liquid media are not recommended for electron microscopy.			
Parainfluenza				
Virus detection by PCR / sequencing	Fluid from respiratory secretions, nose and throat swabs	Contact laboratory	Contact laboratory	RVU
Investigation	**Sample required**	**Target turnaround time**	**Test schedule**	**Contact unit**
Parechovirus				
RT-PCR	Faeces, CSF, respiratory secretions / swab, serum; other samples by arrangement. Minimum volume 200µL	Contact laboratory	Contact laboratory	EVU
Genotyping	Faeces, CSF, respiratory secretions / swab, serum; other samples by arrangement. Minimum volume 200µL	Contact laboratory	Contact laboratory	EVU

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
Parvovirus B19				
Serology (IgG/ IgM)	Serum or plasma (200µL)	10 days	Weekly	CSU
PCR	Serum or plasma, amniotic fluid (150µL), placenta, foetal tissue (frozen)	10 days (Tissue: Contact laboratory)	Twice weekly	IDU
Polioviruses				
Virus isolation & Intertypic Differentiation PCR	Unprocessed faeces (required for all AFP cases): two samples collected 24-48h apart, min.2g (8-10g preferred), respiratory tract specimens, CSF	14 days	Contact laboratory	PRS
Poliovirus serology	Serum with date of collection; please refer to "Poliomyelitis: Indications for serological testing" at www.gov.uk	Contact laboratory	Contact laboratory	PRS
Polyomavirus JC				
PCR	CSF, urine, serum, plasma (150 µL), whole	10 days	Weekly	IDU

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
	blood (300 µL), tissue			
Rabies exposure				
Exposure advice only – contact rabies clerk on 0330 128 1020				
Investigation	**Sample required**	**Target turnaround time**	**Test schedule**	**Contact unit**
Respiratory syncytial virus (RSV)				
Virus detection by multiplex PCR	Fluid from respiratory secretions, nose and throat swabs	7 days in season (November to March)	Daily in season	RVU
Rhinovirus				
Virus detection by PCR	Fluid from respiratory secretions, nose and throat swabs	Contact laboratory	Contact laboratory	RVU
Rubella				
IgG / IgM serology for recent infection	Serum or plasma (50µL), oral fluid (Oracol)	10 days	Weekly	CSU
IgG antibody status	Serum or plasma (100µL)	10 days	Weekly	CSU

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
PCR and genotyping	Oral fluid (Oracol), throat swabs, NPA, urine, CSF (150µL), amniotic fluid (150µL), placenta, foetal tissue (frozen)	Contact laboratory	Contact laboratory	IDU
Intrathecal antibody testing	Paired serum and CSF (750µL each)	Contact laboratory	Contact laboratory	IDU
Investigation	**Sample required**	**Target turnaround time**	**Test schedule**	**Contact unit**
Rotavirus				
RT-PCR (by prior arrangement only)	Faeces (<5 days post-onset); other samples by arrangement. Minimum volume 200µL	Contact laboratory	Clinical samples: weekly	EVU
Genotyping of referred positive samples	Faeces; other samples by prior arrangement. Minimum volume 200µL	Contact laboratory	Contact laboratory	EVU
Sapovirus				
RT-PCR (by prior arrangement only)	Faeces (<5 days post-onset)	Contact laboratory	Contact laboratory	EVU
SARS-CoV-1 and SARS-CoV-2				
Refer to coronavirus section on pages 16 to 17				RVU

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
Contact laboratory prior to collection of specimens for SARS-CoV-1				
Investigation	**Sample required**	**Target turnaround time**	**Test schedule**	**Contact unit**
Treponema (syphilis)				
T.pallidum PCR	Fresh dry swab or swab in viral transport medium is optimal, taken from genital or oral ulcer	6 days	Twice weekly	CSU
Unknown haemadsorbing agents				
	Tissue culture fluid	Contact laboratory	Contact laboratory	RVU
Varicella-zoster virus (VZV)				
IgG serology	Serum (100µL)	21 days	Fortnightly	IDU
IgM serology	Contact laboratory	Contact laboratory	Contact laboratory	IDU
Intrathecal antibody testing	Paired serum and CSF (750µL each)	Contact laboratory	Contact laboratory	IDU
PCR / genotyping	Vesicular fluid (200µL)	21 days	Twice per month	IDU
Viral haemorrhagic fevers				

Investigation	Sample required	Target turnaround time	Test schedule	Contact unit
If infection with a Hazard Group 4 pathogen is suspected, or to discuss an undiagnosed fever from clinical information or travel history, please call the Imported Fever Service on 0844 77 88 990.				

Reports

Reports will be delivered electronically via E-lab, or will be printed and delivered by post if the referring laboratory is not registered to E-lab. For details on how to register for E-lab and further information, please email: LimsHelpdesk@ukhsa.gov.uk

Please note reports will only be sent to the requestor named on the request form.

Policy on emailing reports

The following guidelines have been prepared having taken into account the code of practice on reporting patients' results by email prepared by the Department of Health and Caldicott recommendations.

1. It is UKHSA policy that reports containing patients' data should **not** be sent by email.
2. Emails cannot be relied on to guarantee security of patients' data because they can be intercepted by a third party en route.
3. Reports cannot be sent by fax: there are no fax facilities at UKHSA Colindale.

Quality assurance in VRD

Referral site accreditation information

We receive many requests regarding the accreditation status of VRD. The laboratory is accredited to ISO 15189:2012. The following information may be of assistance:

VRD is a UK Accreditation Services (UKAS) accredited medical laboratory No. 8825

General information about our accreditation (including copies of certificates): see Quality Standards - Microbiology Services

List of accredited services: see the schedule of accreditation on the United Kingdom Accreditation Service (UKAS) website (lab reference 8825).

External Quality Assurance and Proficiency Testing: All VRD laboratories participate in these where available and appropriate for the examination and interpretation of examination results. Any issues with EQA performance that could affect any of the services provided are communicated directly to service users where relevant.

Service updates: Users will be informed in a timely manner of any delays beyond the published turnaround times where these could compromise patient care.

Issue of revised reports: any amendments to original reports will be highlighted to users.

Authorisation of reports: Staff authorising reports are competency assessed, and, additionally, medical staff undergo revalidation to meet the professional standards set by the GMC.

Key contact for general quality-related enquiries:

Quality Assurance Manager, Reference Laboratories - Colindale:
Sangita Sapkota (020 7811 7092)
Email: sangita.sapkota@ukhsa.gov.uk

The quality of our systems is also checked by our IQA schemes, which requires selection of referred samples for ‘blinded’ testing at a later date. After processing, the results for IQA samples are unblinded and are assessed against the results originally reported to the sending laboratory. Any discrepancies are fully investigated as to their root cause before remedial action is implemented. Results of our EQA and IQA performance are discussed at Quarterly Management Review meetings, and also at unit meetings, as appropriate.

Complaints

If there is a problem, or you are not satisfied with the service you have received, in the first instance contact the appropriate Unit Head. Contact details are given on the following pages against each unit, and in summary at the end of the user manual. Otherwise contact:

Quality Implementation and Compliance Manager, Public Health Microbiology Division:
Ifeoma Ekwueme (020 8327 7552)
email: ifeoma.ekwueme@ukhsa.gov.uk

or

Deputy Director, Public Health Microbiology Division:
Neil Woodford (020 8327 6511)
email neil.woodford@ukhsa.gov.uk

Complaints will be responded to within 20 days of notification. Resolution of complaints will be undertaken within the shortest timeframe achievable. If resolution cannot be achieved within 20 days, the complainant will be notified.

Our endeavour is to be responsive to the changing needs of all users of our services. We welcome comments on how we can improve the provision of these services. Please contact the department if you have any queries.

Public Health Microbiology: recognition of Caldicott recommendations

The recommendations of the Caldicott Report (1997) and the subsequent Information Governance Review (2013) have been adopted by UK HSA and by the NHS as a whole. These recommendations relate to the security of patient identifying data (PID) and the uses to which they are put. Public Health Microbiology observes Caldicott guidance in handling PID and has appointed its own Caldicott Guardian. She advises the Director of the VRD and others on confidentiality issues and is responsible for monitoring the physical security of PID in all parts of the Colindale site. This also applies to the transfer of results of investigations to and from the site whether by mail services or telephone.

Public Health Microbiology is keen to audit the security of its PID in collaboration with its customers. Customers are invited to review our arrangements in conjunction with individual laboratory directors and/or the Reference Caldicott Guardian. Customers are also asked to draw to the Reference Laboratories Caldicott Guardian's attention any instances where PID security has been threatened or has broken down. Uses that PID are put to outside clinical diagnostic services generally allow patient identifiers to have been removed beforehand, and when PID is used for research purposes the proposals are considered first by the UKHSA Research Ethics Committee. All enquiries about the security and use of PID at Public Health Microbiology should be addressed to the UKHSA Caldicott Guardian at: caldicott@ukhsa.gov.uk

Compliance with the Human Tissue Act: submitting tissue samples from deceased people

UKHSA Colindale is licensed by the Human Tissue Authority (licence number 12459) to store tissues from deceased people for scheduled purposes. Post-mortem samples are submitted by coroners or pathologists for examination to help them determine the cause of death.

Please note that consent is mandatory for all scheduled purposes. Samples taken from deceased persons that are sent to UKHSA Colindale for testing, where such testing is not related to determining the cause of death as directed by the coroner, will require appropriate consent from the deceased person or their relatives. For example, testing of post-mortem material for infectious agents following a needlestick injury sustained during the post-mortem will require consent. It is the obligation of the requesting clinician or pathologist to ensure that appropriate consent has been obtained.

Obtaining consent to remove, store and use human tissues for a scheduled purpose is one of the underlying principles of the Human Tissue Act. Public Health Microbiology receives post-mortem samples from coroners' post-mortems or from NHS establishments across the UK and therefore we are performing the examination under the authority of the coroner. Unless consent has been obtained or the coroner has requested that samples are retained for further testing, samples are disposed of within 3 months of the initial test being performed.

When tissue samples from deceased people are received at Public Health Microbiology they are retained securely and confidentiality is maintained in compliance with Caldicott principles as are all samples received at this centre. It is normal practice for tissue samples from the deceased to be disposed of in the same way that all others clinical samples we receive are disposed of. However, we will adhere to any specific requirements regarding disposal or returning tissue samples if requested by the sending coroner or pathologist.

Unit information

See also contact details on page 45 to 46.

Antiviral Unit (AVU)

Head of Unit: Dr Tamyo Mbisa
Tel: 020 8327 6099

The Antiviral Unit houses a WHO Global Specialised HIV Drug Resistance Laboratory.

The unit provides reference services for genotypic resistance testing of HIV and HCV (including minority mutant detection), analysis of HIV transmission events for public health-related investigations, HIV subtyping by sequencing, and HSV antiviral resistance testing.

Other reference and training activities include organisation of UK external quality assessment (EQA) for HIV resistance testing, provision of training in laboratory and clinical aspects of HIV, HCV and HSV resistance testing, especially implementation of new assays, and leading the UK HIV genotypic resistance working group.

Research activities include development and roll-out of novel genotypic assays for detection of drug resistance in HIV, HCV and HSV (including next generation sequencing technologies), development and application of phenotypic assays for investigation of HIV drug resistance, investigation of the role of accessory mutations in levels of HIV drug resistance and viral fitness, and investigation of early events in HIV transmission.

Bloodborne Viruses Unit (BBVU)

Unit Head: Dr Samreen Ijaz
Tel: 020 8327 6554

The Blood Borne Virus Unit is engaged in research and development on Hepatitis Viruses and works closely with the Clinical Services Unit (CSU) at UKHSA Colindale and with the NHS Blood and Transplant Service (NHSBT).

Some of the work of the UKHSA Blood Borne Virus Unit is around improving blood safety. This is funded by NHSBT and members of the unit work closely with colleagues in the NHSBT UKHSA Epidemiology Unit.

The unit provides services for the molecular epidemiology of Hepatitis A, B, C and E transmission incidents and outbreaks, antiviral resistance testing for HBV, anti-HBc avidity

testing, screening for HBsAg, pre-core and BCP mutations, sequencing and phylogenetic analysis for Hepatitis A, B, C and E, and real-time HDV RNA and HEV RNA assays.

Surveillance activities include sequencing of acute HAV and HBV cases, and enhanced surveillance programmes for HAV, HBV and HEV. For details on the enhanced surveillance programmes, please contact the unit.

Research activities include epitope mapping of HBsAg variants including vaccine escape mutants, and blood safety studies in collaboration with NHSBT.

Clinical Services Unit (CSU)

Unit Head:	Dr Daniel Bradshaw	(Tel: 020 8327 6109)
Scientific Leads:	Dr Gary Murphy	(Tel: 020 8327 6935)
Clinical Scientist	Dr Siew-Lin Ngui	(Tel: 020 8327 6555)

Clinical enquiries:

HIV, HTLV- Daniel Bradshaw	(Tel: 020 8327 6109)
Hepatitis – Dr Siew-Lin Ngui	(Tel: 020 8327 6555)
HHV-8 – Dr Simon Carne	(Tel: 020 8327 6546)

The unit provides diagnostic reference work relating to HIV-1 and HIV-2, Hepatitis viruses A, B, C, D and E, HTLV-I and -II, HHV-8, measles, mumps, rubella, parvovirus B19 and Treponema (syphilis). The laboratory also undertakes molecular confirmatory testing for LGV. A full list of services provided by the unit is shown in the Services available section beginning on page 15 of this manual. The Laboratory provides high-throughput serological and molecular surveillance services. The Unit is listed as a WHO Pre-qualification evaluation laboratory.

Enteric Viruses Unit (EVU)

Head of Unit: Dr. Cristina Celma
Tel: 020 83277846

The primary function of the national reference laboratory is to characterise non-polio enteroviruses, rotaviruses and noroviruses, to support national surveillance programmes and investigations of significant outbreaks. EVU can perform detection assays for specific enteric viruses, but only when detection assays are not offered by NHS and regional UKHSA Public Health Laboratories. EVU characterisation assays are not associated with specific turn-around times.

A comprehensive sequence database of characterised norovirus, sapovirus, astrovirus and rotavirus strains, including geographical and temporal distributions and the genetic diversity of

co-circulating strains, has been established in collaboration with the Bioinformatics Unit. EVU collaborates with other UKHSA departments, NHS and academic institutions in the structured surveillance and study of enteric virus infections and the diseases they cause.

High Containment Microbiology and Imaging department

The department provides diagnostic support for high consequence pathogens.

If infection with a Hazard Group 4 pathogen is suspected, or to discuss an undiagnosed fever from clinical information or travel history, call the Imported Fever Service on 0844 77 88 990.

We have a modern ultrastructural imaging facility with a 120kV high-contrast, transmission electron microscope and a state-of-the-art laser scanning confocal microscope. The facility provides a diagnostic service to the NHS for orf and molluscum contagiosum viruses using negative stain EM. Referral is via the VRD General Office 020 83277887 (staffed 9am to 5.00pm Monday to Friday).

Human Papillomavirus Unit

Head of Unit: Dr Simon Beddows
Tel: 020 8327 6169

The unit contributes to national sexually transmitted infection surveillance programmes designed to monitor the impact of the HPV vaccines on the UK population. We also undertake studies to understand the immune responses generated following HPV vaccination and those generated during natural infection. The unit does not offer a diagnostic service for HPV infection.

Immunisation and Diagnosis Unit (IDU)

Head of Unit: Dr Keith Perry
Tel: 020 8327 6308

The unit provides diagnostic and reference services for measles, mumps, rubella, JC polyomavirus, parvovirus B19 (B19V), varicella-zoster virus (VZV), HHV6 and HHV7, and in collaboration with the Immunisation Department is responsible for the enhanced laboratory surveillance for measles, mumps and rubella infection in the UK. The laboratory also offers intrathecal antibody testing for investigation of meningoencephalitis.

The unit is a national and international reference centre for rash associated viral infections and the unit receives clinical samples and virus isolates from UKHSA, NHS and commercial laboratories across the UK and from overseas.

Services provided by the laboratory include reference serum and oral fluid antibody tests for rash illnesses, advice on management of rash outbreaks, investigation of adverse reactions following vaccination, and antigenic characterisation of measles, mumps, rubella and B19 infections.

In collaboration with CSU, the unit carries out oral fluid testing (for both antibody and RNA detection) for measles, mumps and rubella. Testing of samples obtained by this non-invasive method has greatly enhanced measles, mumps and rubella surveillance in the UK, and has been invaluable in tracking recent changes in measles epidemiology following the drop in MMR vaccine uptake in the UK due to unfounded doubts about vaccine safety.

The unit also provides advice on serological assay development, is involved in the development of near-patient tests, and provides monoclonal antibody generation and immunochemical modifications. For further information on these services, please contact the unit.

The unit is 1 of 3 WHO Global Specialized laboratories for Measles and Rubella (the other 2 are located in the USA and Japan). As such, it is responsible for the following services to laboratories within the global network:

- provision of technical advice and specialised training to regional and national laboratories
- provision of laboratory standards, training materials and quality control panels of sera and viruses
- organisation of periodic proficiency testing for regional laboratories
- evaluation and improvement of diagnostic kits and methods
- maintenance of the Measles and Rubella Virus reference strain bank
- provision of viral sequencing and analysis on request
- administration and maintenance of the 2 WHO measles and rubella sequence databases (MeaNS and RubeNS, respectively)

Polio Reference Service (PRS)

Head of Service: Dr Robin Gopal
Tel: 020 8327 6437

The Polio Reference Service (PRS) is the WHO-accredited UK national poliovirus laboratory and undertakes performs analyses to exclude polio virus infection using methodology specified by WHO as part of the global eradication programme. This includes virus isolation by specific

cell culture, application of WHO molecular assays, and detection and quantification of anti-poliovirus neutralising antibodies.

The UK is committed to the Global Polio Eradication Initiative and has to conform to the poliovirus testing requirements set by the WHO Global Action Plan in compliance with WHO polio surveillance requirements. As such, it is essential that the correct sample types be submitted from all cases of suspected poliomyelitis and any case of acute flaccid paralysis/myelitis; further information can be found in the A-Z list of tests available, or by contacting PRS.

Respiratory Virus Unit (RVU)

Head of Influenza and Respiratory Virology:
Professor Maria Zambon Tel: 020 8327 6810

RVU Unit Head: Dr Katja Hoschler
Tel: 020 8327 7002

The unit provides antigenic and genetic analysis of influenza isolates, and molecular detection, virus isolation in culture and serology tests for a range of respiratory viruses and investigation of outbreaks of respiratory virus infection. Genetic characterisation of respiratory viruses is undertaken, including whole genome sequencing of influenza viruses. Influenza antiviral susceptibility primary testing is performed as required, with genotypic and phenotypic characterisation of strains.

As a WHO National Influenza Laboratory, the unit undertakes:

- national surveillance of influenza and other respiratory viruses
- antigenic and genetic characterisation of circulating influenza strains is performed
- data provided to WHO as evidence from the UK to guide the annual formulation of the influenza vaccine
- surveillance of antiviral susceptibility of influenza viruses derived from community and hospital sources, with monitoring achieved through genotypic and phenotypic analysis

The unit also contributes virological data (antigenic and genetic) to assist seasonal influenza vaccine effectiveness (VE) estimates, including assessment of the effectiveness of new vaccination programmes.

The work of RVU also involves the development of diagnostic tests for current and emerging respiratory viruses, and vaccine evaluation studies.

The unit is 1 of 3 WHO global RSV Reference Laboratories, and as such collaborates with WHO, providing technical support and advice to national laboratories.

The unit is also a WHO MERS-CoV Reference Laboratory, providing confirmatory and reference services for MERS-CoV, and a WHO Reference Laboratory for confirmatory testing for COVID-19.

Contacts

Name	Designation	Email	Telephone
Antiviral Unit (AVU)			
Dr Tamyo Mbisa	Unit Head	tamyo.mbisa@ukhsa.gov.uk	020 8327 6099
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Enteric Virus Unit (EVU)			
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Stuart Beard	Senior BMS	stuart.beard@ukhsa.gov.uk	020 8327 6225
Mihaela Cirdei	Technical Manager	mihaela.cirdei@ukhsa.gov.uk	020 8327 6229
HPV Unit			
Dr Simon Beddows	Unit Head	simon.beddows@ukhsa.gov.uk	020 8327 6169
Immunisation and Diagnosis Unit (IDU)			
Dr Stephen Winchester	CRF Medical Consultant Virologist	stephen.winchester@ukhsa.gov.uk	020 8327 6023
Dr Keith Perry	Unit Head	keith.perry@ukhsa.gov.uk	020 8327 6308
Dr Jade Derrick	Clinical Scientist	jade.derrick@ukhsa.gov.uk	020 8327 7802
Mihaela Cirdei	Technical Manager	mihaela.cirdei@ukhsa.gov.uk	020 8327 6229
Polio Reference Service (PRS)			
Dr Robin Gopal	Head of Service	robin.gopal@ukhsa.gov.uk	020 8327 6437
Mihaela Cirdei	Technical Manager	mihaela.cirdei@ukhsa.gov.uk	020 8327 6229
Respiratory Virus Unit (RVU)			
Prof. Maria Zambon	Head of Influenza and Respiratory Virology	maria.zambon@ukhsa.gov.uk	020 8327 6810
Dr Katja Hoschler	RVU Unit Head	katja.hoschler@ukhsa.gov.uk	020 8327 7002
Janice Baldevarona	Technical Manager	janice.baldevarona@ukhsa.gov.uk	020 8327 6228

Name	Designation	Email	Telephone
Clinical Services Unit (CSU)			
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Dr Gary Murphy	Scientific Lead	gary.murphy@ukhsa.gov.uk	020 8327 6935
Shabnam Jamarani	Technical Manager	shabnam.jamarani@ukhsa.gov.uk	020 8327 6939
Dr Siew Lin Ngui	Clinical Scientist	siewlin.ngui@ukhsa.gov.uk	020 8327 6554
Dr Simon Carne	Clinical Scientist	simon.carne@ukhsa.gov.uk	020 8327 6546
Advice on management of rabies exposure			
	Rabies clerk		0330 128 1020
Quality (general queries, compliance and complaints)			
Ifeoma Ekwueme	Quality Implementation and Compliance Manager	ifeoma.ekwueme@ukhsa.gov.uk	020 8327 7552
Sangita Sapkota	Quality Assurance Manager	sangita.sapkota@ukhsa.gov.uk	020 8327 6911
VRD General Office			
	Enquiries	vrdqueries@ukhsa.gov.uk	0208 327 7887

About the UK Health Security Agency

UKHSA is responsible for protecting every member of every community from the impact of infectious diseases, chemical, biological, radiological and nuclear incidents and other health threats. We provide intellectual, scientific and operational leadership at national and local level, as well as on the global stage, to make the nation health secure.

UKHSA is an executive agency, sponsored by the Department of Health and Social Care.

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