

## Review

# Detectability of Pathogenic RNA Virus Families in Different Body Sites: A Scoping Review

Christian Schaadt Ilsby <sup>1,2,3,\*</sup>, Thomas Leineweber Kristensen <sup>1,2,3</sup>, Kristian Bagge <sup>2,3,4</sup>, Jens Bukh <sup>2,5</sup>, Jan Gorm Lisby <sup>3,6</sup> and Uffe Vest Schneider <sup>1,2,3</sup>

<sup>1</sup> Department of Virology and Microbiological Preparedness, Statens Serum Institut, 2300 Copenhagen, Denmark; thlk@ssi.dk (T.L.K.); ufvs@ssi.dk (U.V.S.)

<sup>2</sup> Copenhagen Hepatitis C Program (CO-HEP), Department of Immunology and Microbiology, University of Copenhagen, 2200 Copenhagen, Denmark; work@kristianbagge.com (K.B.); jbukh@sund.ku.dk (J.B.)

<sup>3</sup> Department of Clinical Microbiology, Copenhagen University Hospital—Hvidovre, 2650 Hvidovre, Denmark; jan.gorm.lisby@regionh.dk

<sup>4</sup> Department of Data Integration and Analysis, Statens Serum Institut, 2300 Copenhagen, Denmark

<sup>5</sup> Copenhagen Hepatitis C Program (CO-HEP), Department of Infectious Diseases, Copenhagen University Hospital—Hvidovre, 2650 Hvidovre, Denmark

<sup>6</sup> Department of Clinical Medicine, University of Copenhagen, 2200 Copenhagen, Denmark

\* Correspondence: csci@ssi.dk

## Abstract

Nucleic acid amplification tests (NAATs) are central to modern virology diagnostics. However, evidence supporting alternative specimen types remains uneven across viral families, especially for emerging viruses. This limits diagnostic flexibility in outbreak and clinically complex settings. We conducted a scoping review of NAAT detectability across key body sites for human RNA viruses. PubMed and Embase were systematically searched for studies reporting NAAT results from urine, blood, fecal, cerebrospinal fluid, or respiratory specimens. Data were independently screened and synthesized to summarize specimen-specific detectability for each virus. From 8676 screened records, 321 studies were included, covering 39 viruses across 25 RNA virus families. Detectability across specimen types varied substantially between viruses. Consistent detection across multiple specimens was observed for few viruses, including SARS-CoV-2, Zika virus, and HIV, whereas many emerging viruses were evaluated in a single body compartment with limited comparative data. NAAT performance across specimen types is highly virus-specific and unevenly studied, with reliance on blood or respiratory specimens, potentially overlooking viable, less invasive alternatives. Evidence gaps are particularly pronounced for urine and cerebrospinal fluid, and heterogeneous reporting limits cross-study comparability. Standardized, cross-specimen and longitudinal studies are needed to improve diagnostic strategies, outbreak preparedness, and future assay development.

**Keywords:** RNA viruses; viral tropism; diagnostic sampling; body sites; viral detection; scoping review

Academic Editor: Jeremy Thompson

Received: 16 April 2026

Revised: 11 June 2026

Accepted: 2 July 2026

Published: 4 July 2026

**Copyright:** © 2026 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the [Creative Commons Attribution \(CC BY\)](https://creativecommons.org/licenses/by/4.0/) license.

## 1. Introduction

Nucleic acid amplification tests (NAATs), particularly polymerase chain reaction (PCR), have transformed the field of virology by providing a highly sensitive and specific method for confirming the presence of viruses. PCR has become a cornerstone in clinical

infectious disease diagnostics, allowing for the rapid and accurate identification of viral pathogens from a variety of biological specimens. This technology plays a pivotal role in early diagnosis, treatment monitoring, and epidemiological surveillance, significantly improving patient outcomes and public health responses [1].

Across virology, alternative specimen types for virus diagnostics are actively studied, but the depth and quality of this work are uneven—particularly for emerging human viruses [2,3]. In practice, most NAAT-based research continues to rely on well-established specimen types known to perform consistently, leaving gaps in knowledge that likely vary substantially between viral families [4].

Viral RNA may be detectable in specimens beyond the primary site of infection owing to systemic dissemination, viral shedding into bodily fluids, and persistence of viral nucleic acids. Consequently, detectability may vary substantially across specimen types and stages of infection [5–7]. Alternative specimen studies may provide valuable diagnostic information in clinically complex cases. This can be true when delayed diagnostic clarity means that only non-standard specimen types are available during the relevant disease window. Additionally, expanding sampling coverage within known viral families is important for future screening programs, since virus discoveries are expected to predominantly fall within these rather than representing novel families [8–10].

Across viruses and specimen types substantial heterogeneity in study design, reporting practices, detectability, and data presentation is present. Due to these differences as well as the quantity of studies identified, a scoping review was considered the most appropriate approach to meaningfully characterize the existing evidence and identify gaps in knowledge. Accordingly, this scoping review aims to provide a comprehensive overview of the detectability and diagnostic utility of NAATs across all RNA virus families affecting human patients. Additionally, we will focus on identifying the evidence supporting the use of specimens from different body sites for viral detection. By synthesizing current knowledge on NAAT performance across specimen types and highlighting areas of limited or uneven evidence, this review seeks to inform future research priorities and may potentially support improved diagnostic strategies in outbreak and clinically complex settings.

## 2. Materials and Methods

This study was conducted in accordance with the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) (Table S1) [11,12]. The review was prospectively registered on PROSPERO (CRD42024608133).

This scoping review was conducted according to the Joanna Briggs Institute (JBI) methodology for scoping reviews and structured using the Population–Concept–Context (PCC) framework. The population comprised human cases with confirmed RNA virus infection, the concept was detectability by NAAT and the context was clinical diagnostic specimens. The review question was: “What evidence exists regarding the detectability of human pathogenic RNA viruses by NAAT across different clinical specimen types, and where are the current gaps in knowledge?”

### 2.1. Viruses and Specimen Types

All RNA viruses found in humans and related to human disease were examined in the study with at least one representative virus for each family [13,14]. As such, 25 RNA virus families with 39 relevant viruses were included. Families more commonly associated with hospital diagnostics have several viruses included in the scoping review. Additionally, due to the impending reorganization of *Flaviviridae*, we found it prudent to accommodate the changes in advance [15].

As we intend to cover all major body sites, we included clinical urine, blood, fecal, central nervous system (CNS) specimens, or respiratory specimens as well as related specimen types. Related specimen types for each body site are:

- Blood specimens: whole blood, serum, plasma, and PBMC;
- Respiratory specimens: saliva, bronchoalveolar lavage (BAL), oropharyngeal swabs, nasopharyngeal swabs, nasal swabs, and oral swabs, sputum;
- Fecal specimens: stool and rectal swabs;
- Urine specimens: urine, urinary sediment, and urine supernatant;
- CNS specimens: cerebrospinal fluid (CSF).

## 2.2. Search Strategy and Selection Criteria

Through systematic searches of PubMed and Embase using Medical Subject Heading (MeSH), Emtree, and title/abstract terms, we retrieved research articles according to the predefined PCC framework and eligibility criteria for each of the 39 included viruses. Full search strategies are provided in Table S2. We included randomized controlled trials, cohort studies, case-control studies, diagnostic accuracy studies, cross-sectional studies, case series and case reports that fulfilled the eligibility criteria. Subsequently, the reference lists of included studies and relevant excluded reviews were also screened for additional studies.

Given the broad scope of the review, encompassing 39 viruses across 25 RNA virus families, measures were prespecified to maintain feasibility while prioritizing studies providing comparative information relevant to the review objective. When a specific virus-specimen search combination yielded more than 500 records, the search strategy was refined to preferentially identify studies evaluating that specimen together with one or more additional specimen types. For example, if a virus-blood specimen search exceeded the threshold, blood-related search terms were combined with at least one additional specimen category, whereas searches involving less frequently studied specimens remained unchanged. This approach reduced retrieval of studies examining only established reference specimens while retaining studies capable of informing cross-specimen detectability. The threshold of 500 records was selected a priori as a pragmatic limit to maintain feasibility. Full search strategies are provided in Table S2.

During full-text screening, studies were prioritized according to a prespecified hierarchy favoring (i) evaluation of multiple specimen types within the same patients, (ii) larger patient cohorts, and (iii) longitudinal sampling. When multiple studies provided overlapping information for a given virus-specimen combination, studies with greater comparative value were retained while less informative studies were excluded according to the hierarchy (Appendix A, Table A1). This approach was intended to maximize the breadth of specimen-level evidence while maintaining a feasible review process.

## 2.3. Eligibility Criteria

### Inclusion:

- Human cases with confirmed infection by a virus of interest.
- Viral nucleic acid testing (NAAT) performed.
- Clinical specimens of urine, blood, feces, cerebrospinal fluid, or respiratory material collected for diagnostic purposes.

### Exclusion:

- Duplicate patient data published elsewhere.
- Studies limited to post-mortem, asymptomatic screening, neonates, immunocompromised patients, pregnant persons, or antivirally treated cases prior to NAAT testing.
- Studies primarily comparing a novel non-NAAT assay against a standard NAAT.

- Reviews and conference abstracts.

While immunocompromised patients are excluded, human immunodeficiency virus (HIV) was included in study screening. As such, individuals with HIV were excluded if they were considered severely immunodeficient, defined as having a CD4 count below 200 cells/ $\mu$ L or a CDC clinical category of C or higher.

#### 2.4. Data Extraction

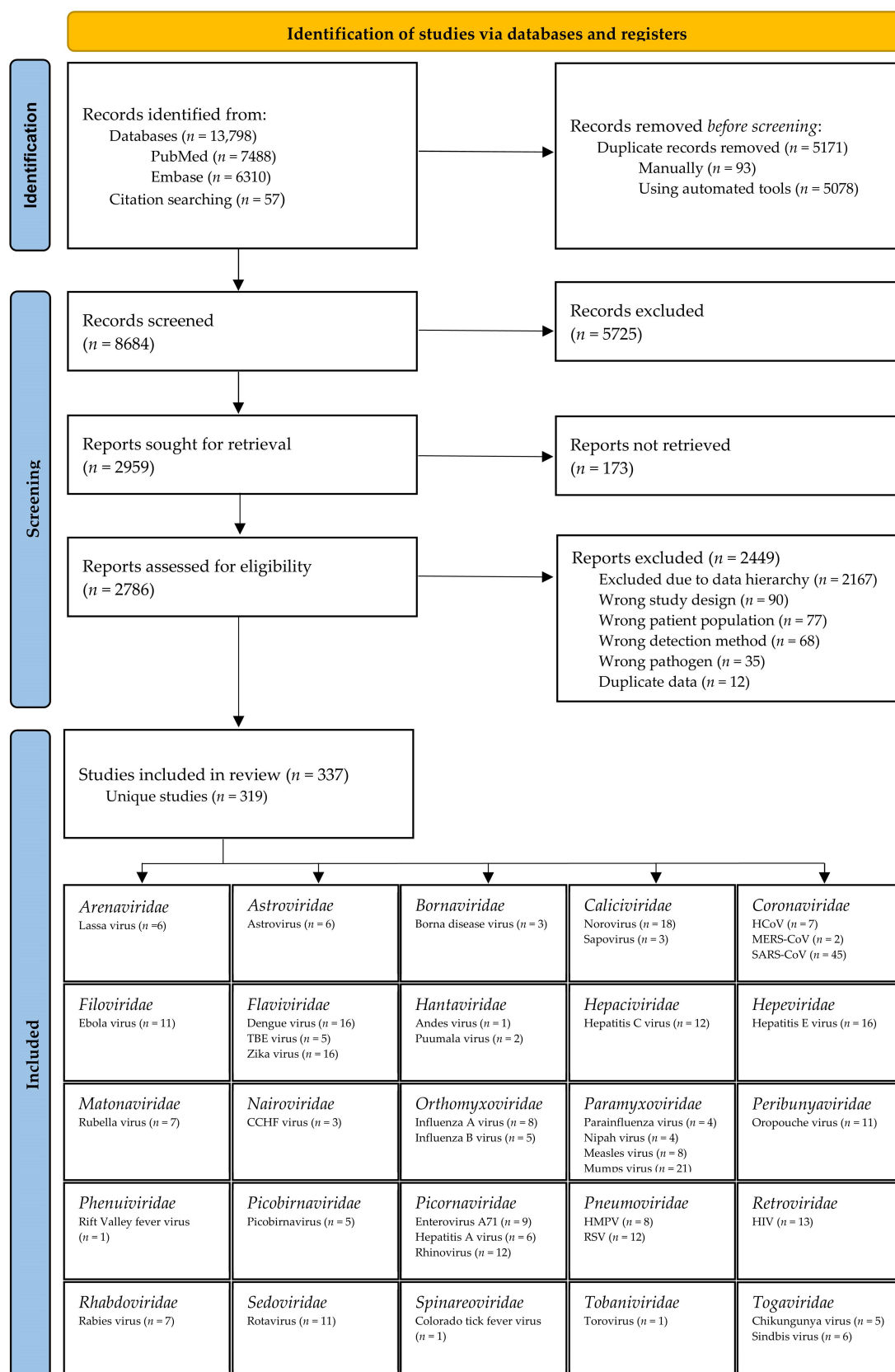
Two authors (CI and TK) independently charted data by using two non-included DNA-viruses mpox virus and adenovirus to determine software choice and extraction variables [12]. Afterwards, three authors (CI, TK and KB) independently screened and retrieved articles according to the eligibility criteria, reviewed full-text articles for final inclusion in the review, and performed the subsequent data extraction and critical appraisal. Each data point of screening selection and data extraction had a minimum of two people assessing. Any disagreements regarding study inclusion or data were resolved through discussion between the three authors—CI had final say. Extracted data contains as a minimum: distribution of age, distribution of sex, number of cases, number of detected cases ( $C_d$ ) compared to total cases ( $C_t$ ), type of NAAT used, examined specimen types (and related specimens), and presence of data on detectability over time. If able, the authors extracted data on time to viral clearance or last day reported test-positive. If virus findings were not reported per individual and/or specimen types were not described, the study was excluded due to “wrong study design”. If specific data items were missing or unclear, it was logged as “not extractable”. If the method of diagnosis for the intended virus was unclear or different from NAAT the article was excluded due to “wrong detection method”. All study screening, data extraction and appraisal was performed using the Covidence platform (Covidence systematic review software, Veritas Health Innovation, Melbourne, Australia. Available at [www.covidence.org](http://www.covidence.org)).

#### 2.5. Synthesis of Evidence

Descriptive synthesis of evidence was performed for the studies included. For each study, each examined specimen had its  $C_d/C_t$  proportion logged for each virus of interest. The  $C_d/C_t$  proportions were subsequently presented as percentage value ranges for each virus and each specimen type. Subsequently for each virus and specimen type an overall detectability estimate (D) was given by the authors for each based on the relationship between  $C_d$  and  $C_t$  of the individual studies and their hierarchy categories (Table 1). The certainty of each D estimate was qualitatively assessed according to the volume and strength of available evidence, including (i) number of studies, (ii) hierarchical study quality, and (iii) total number of examined cases. Virus–specimen combinations supported by sparse evidence (e.g., few studies, low hierarchical rating, and/or small cumulative sample size) were labeled as uncertain and are indicated by hatched shading in Table 1. For viruses where NAAT in a specific specimen type constitutes the diagnostic reference standard, detection in that specimen was inherently near 100%, as case confirmation was contingent upon positivity in that specimen. The studies included were categorized according to the following study characteristic: (1) virus examined, (2) specimen types examined, (3) longitudinal data, and (4) hierarchical category (Table S3).

### 3. Results

In the scoping review 8676 titles and abstracts were screened with 2959 articles sought for retrieval. Based on our eligibility criteria, 319 unique studies were included throughout all the 25 virus families (Figure 1).



**Figure 1.** Inclusion flowchart. Inclusion flowchart showing the 319 included studies in the review. Eight studies contained data for multiple different viruses and had data extracted for each relevant virus.

Of the 319 studies included, 8 contained data relevant for several viruses [16–23]. A total of 161 studies contained data on consecutive patient sampling for the included virus. A sum of 102 studies were graded A in hierarchical screening for two or more specimen types (Table S3). A total of 27 studies contained data on at least four different specimen types [22,24–49], with 3 studies containing data on all five [50–52].

For each virus, the specimen type constituting the diagnostic reference standard was identified where applicable and is indicated in Table 1 and Figure 2. Detectability estimates for alternative specimens were interpreted relative to these reference-standard specimens.

Within *Arenaviridae* Lassa virus was analyzed and had all specimen types except fecal specimens reported. Detection outside the blood reference standard was reported mainly in isolated case reports with urine appearing an option despite low total tested cases (Range: 80–100%).

*Adenoviridae* was almost exclusively examined in the reference standard fecal specimens. Blood or respiratory material studies trended poorly in detection for human astrovirus ( $C_d/C_t$ : 1/5, 6/25) but data is sparse and insufficient.

*Bornaviridae* was only described in small series or individual cases, with CSF as the primary diagnostic material and only a single case report examining other specimens than CSF or blood [50].

For *Caliciviridae*, fecal specimens are the reference standard. Norovirus was well characterized in blood and respiratory specimens but the performance was poor ( $C_d/C_t$ : 50/388, 66/384). Sapovirus remained limited to fecal surveillance with low detection in other specimens across two studies [16,19]. Urine specimens were never assessed for this family.

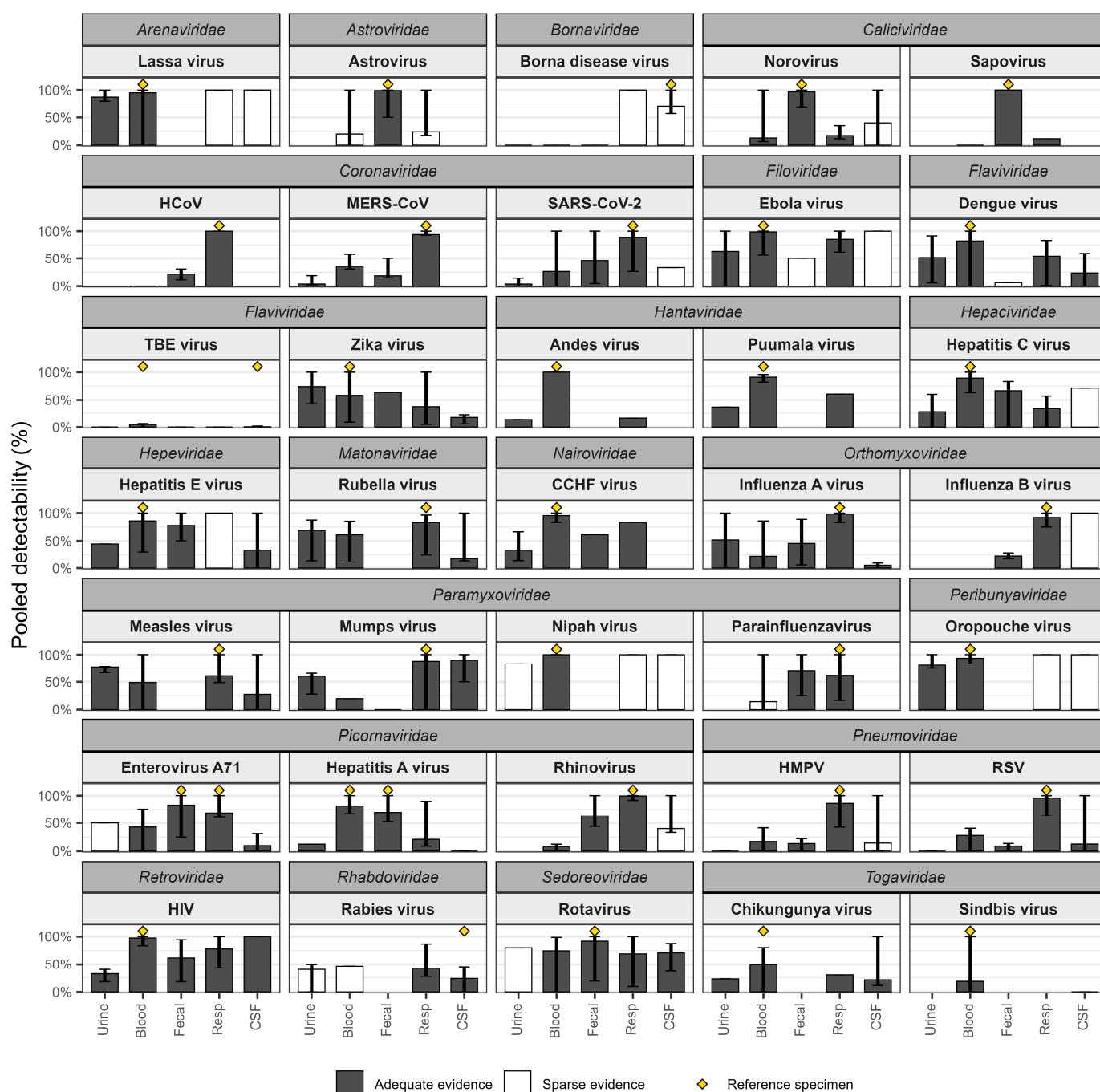
Among *Coronaviridae*, respiratory specimens were the reference standard. Human coronaviruses OC43, NL63, HKU-1 and 229E (HCoV) were sparsely studied beyond respiratory specimens but, from the sparse literature on fecal detection, were found low and viremia never detected ( $C_d/C_t$ : 0/58) [17,53,54]. Middle east respiratory syndrome-coronavirus (MERS-CoV) was evaluated in two comprehensive case series with similar findings; however, there were no reports on CNS testing even in severe cases [24,25]. Due to the international focus, severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) had been comprehensively assessed across all specimen types, even occasionally for CSF in severe disease with mixed findings ( $C_d/C_t$ : 4/12) (Table 1).

**Table 1.** Ranges of detectability across five specimen types.

| Family                  | Virus                     | Urine |         |         |                 | Blood |         |          |                         | Respiratory |         |           |                              | Cerebrospinal |         |         |                               | Fecal |         |           |                       |
|-------------------------|---------------------------|-------|---------|---------|-----------------|-------|---------|----------|-------------------------|-------------|---------|-----------|------------------------------|---------------|---------|---------|-------------------------------|-------|---------|-----------|-----------------------|
|                         |                           | D     | Range   | Ca/Ct   | References      | D     | Range   | Ca/Ct    | References              | D           | Range   | Ca/Ct     | References                   | D             | Range   | Ca/Ct   | References                    | D     | Range   | Ca/Ct     | References            |
| <i>Arenaviridae</i>     | Lassa virus               |       | 80–100% | 7/8     | [55–57]         |       | 0–100%  | 39/41    | [55–60]                 |             | 100%    | 2/2       | [57]                         |               | 100%    | 2/2     | [58,60]                       |       | -       | -         | -                     |
| <i>Astroviridae</i>     | Human astrovirus          |       | -       | -       | -               |       | 0–100%  | 1/5      | [19,61]                 |             | 17–100% | 6/25      | [16,61]                      |               | -       | -       | -                             |       | 50–100% | 101/102   | [16,19,61–64]         |
| <i>Bornaviridae</i>     | Borna disease virus       |       | 0%      | 0/1     | [50]            |       | 0%      | 0/8      | [50,65]                 |             | 100%    | 1/1       | [50]                         |               | 57–100% | 7/10    | [50,65,66]                    |       | 0%      | 0/1       | [50]                  |
| <i>Caliciviridae</i>    | Norovirus                 |       | -       | -       | -               |       | 6–100%  | 50/388   | [67–72]                 |             | 12–35%  | 66/384    | [16,73,74]                   |               | 0–100%  | 2/5     | [67,68,72,75]                 |       | 69–100% | 794/819   | [16,67–83]            |
| <i>Caliciviridae</i>    | Sapovirus                 |       | -       | -       | -               |       | 0%      | 0/10     | [19]                    |             | 12%     | 5/43      | [16]                         |               | -       | -       | -                             |       | 100%    | 148/148   | [16,19,84]            |
| <i>Coronaviridae</i>    | HCoV                      |       | -       | -       | -               |       | 0%      | 0/58     | [17,53,54]              |             | 100%    | 775/775   | [17,18,53,54,85–87]          |               | -       | -       | -                             |       | 11–31%  | 19/89     | [18,53,54]            |
| <i>Coronaviridae</i>    | MERS-CoV                  |       | 2–19%   | 7/185   | [24,25]         |       | 31–58%  | 47/132   | [24,25]                 |             | 93–100% | 218/232   | [24,25]                      |               | -       | -       | -                             |       | 15–50%  | 17/92     | [24,25]               |
| <i>Coronaviridae</i>    | SARS-CoV-2                |       | 0–14%   | 18/479  | [26–33,88–94]   |       | 0–100%  | 141/536  | [26,29,30,32,33,93–103] |             | 26–100% | 2613/2949 | [26–33,88–99,101–121]        |               | 33%     | 4/12    | [103]                         |       | 4–100%  | 1040/2265 | [26–33,88–91,94–125]  |
| <i>Filoviridae</i>      | Ebola virus               |       | 0–100%  | 14/22   | [34,35,126,127] |       | 57–100% | 810/820  | [34,35,126–134]         |             | 62–100% | 53/62     | [34,35,127,132]              |               | 100%    | 2/2     | [34,129]                      |       | 50%     | 2/4       | [35]                  |
| <i>Flaviviridae</i>     | Dengue virus              |       | 6–92%   | 398/777 | [23,135–145]    |       | 0–100%  | 632–766  | [23,135,136,138–149]    |             | 1–83%   | 316–574   | [135,136,139,141–145]        |               | 0–60%   | 8/34    | [146–149]                     |       | 6%      | 2/32      | [137]                 |
| <i>Flaviviridae</i>     | TBE virus                 |       | 0%      | 0/11    | [150]           |       | 0–6%    | 13/281   | [37,150–153]            |             | 0%      | 0/15      | [150,153]                    |               | 0–2%    | 1/220   | [151–153]                     |       | 0%      | 0/2       | [37]                  |
| <i>Flaviviridae</i>     | Zika virus                |       | 43–100% | 676/912 | [23,38,154–165] |       | 9–100%  | 643/1103 | [20,23,38,154–166]      |             | 5–100%  | 279/734   | [38,154,155,157,160–162,164] |               | 6–22%   | 21/122  | [20,166]                      |       | 63%     | 165/260   | [38]                  |
| <i>Hantaviridae</i>     | Andes virus               |       | 13%     | 8/60    | [167]           |       | 100%    | 131/131  | [167]                   |             | 16%     | 21/131    | [167]                        |               | -       | -       | -                             |       | -       | -         | -                     |
| <i>Hantaviridae</i>     | Puumala virus             |       | 37%     | 25/67   | [168]           |       | 82–96%  | 91/100   | [168,169]               |             | 61%     | 20/33     | [169]                        |               | -       | -       | -                             |       | -       | -         | -                     |
| <i>Hepaciviridae</i>    | Hepatitis C virus         |       | 0–60%   | 61/222  | [36,170–174]    |       | 63–100% | 377/422  | [36,170–180]            |             | 0–57%   | 62/180    | [36,170–173,175,176]         |               | 71%     | 5/7     | [177]                         |       | 0–83%   | 82/123    | [36,178–180]          |
| <i>Hepeviridae</i>      | Hepatitis E virus         |       | 44%     | 4/9     | [181]           |       | 30–100% | 128/149  | [181–196]               |             | 100%    | 8/8       | [192]                        |               | 0–100%  | 6/18    | [182,183,185,188–191,194–196] |       | 50–100% | 84/108    | [184–187,189,193,194] |
| <i>Matonaviridae</i>    | Rubella virus             |       | 14–87%  | 349/506 | [197–200]       |       | 11–85%  | 362/594  | [197,199–203]           |             | 25–96%  | 533/642   | [197,199–203]                |               | 14–100% | 4/22    | [21,203]                      |       | -       | -         | -                     |
| <i>Nairoviridae</i>     | CCHF virus                |       | 15–67%  | 22/66   | [39,204,205]    |       | 83–100% | 63/66    | [39,204,205]            |             | 83%     | 15/18     | [39]                         |               | -       | -       | -                             |       | 61%     | 11/18     | [39]                  |
| <i>Orthomyxoviridae</i> | Influenza A virus         |       | 0–100%  | 30/58   | [40–42,51]      |       | 0–86%   | 25/112   | [40–42,51,206,207]      |             | 83–100% | 160/163   | [40–42,51,206–209]           |               | 0–9%    | 1/20    | [51,206,209]                  |       | 6–89%   | 40/88     | [40–42,51,208]        |
| <i>Orthomyxoviridae</i> | Influenza B virus         |       | -       | -       | -               |       | -       | -        | -                       |             | 75–100% | 177/192   | [18,210,211]                 |               | 100%    | 2/2     | [212,213]                     |       | 18–28%  | 30/132    | [18,210]              |
| <i>Paramyxoviridae</i>  | Measles virus             |       | 67–77%  | 506/661 | [214–216]       |       | 0–100%  | 81/166   | [202,214,215,217,218]   |             | 49–100% | 149/245   | [202,214–219]                |               | 0–100%  | 17/62   | [202,216–220]                 |       | -       | -         | -                     |
| <i>Paramyxoviridae</i>  | Mumps virus               |       | 28–65%  | 136/226 | [221–226]       |       | 20%     | 23/116   | [222]                   |             | 0–100%  | 363/412   | [221–229]                    |               | 50–100% | 173/192 | [21,221,223,227–240]          |       | 0%      | 0/1       | [229]                 |
| <i>Paramyxoviridae</i>  | Nipah virus               |       | 83%     | 5/6     | [241]           |       | 100%    | 19/19    | [242,243]               |             | 100%    | 7/7       | [242,244]                    |               | 100%    | 1/1     | [242]                         |       | -       | -         | -                     |
| <i>Paramyxoviridae</i>  | Human parainfluenza virus |       | -       | -       | -               |       | 0–100%  | 1/7      | [17,245]                |             | 17–100% | 8/13      | [17,18,245]                  |               | -       | -       | -                             |       | 25–100% | 7/10      | [18,246]              |

|                         |                           |  |         |        |           |   |         |          |                  |   |         |           |                    |   |         |        |                        |   |         |         |                       |
|-------------------------|---------------------------|--|---------|--------|-----------|---|---------|----------|------------------|---|---------|-----------|--------------------|---|---------|--------|------------------------|---|---------|---------|-----------------------|
| <i>Peribunyaviridae</i> | Oropouche virus           |  | 75–100% | 4/5    | [247,248] | * | 83–100% | 291/311  | [247–255]        |   | 100%    | 2/2       | [248]              |   | 100%    | 6/6    | [256,257]              |   | -       | -       | -                     |
| <i>Phenuiviridae</i>    | Rift Valley fever virus   |  | -       | -      | -         | * | 79%     | 49/62    | [258]            |   | -       | -         | -                  |   | -       | -      | -                      |   | -       | -       | -                     |
| <i>Picobirnaviridae</i> | Picobirnavirus            |  | -       | -      | -         |   | -       | -        | -                |   | -       | -         | -                  |   | -       | -      | -                      |   | 100%    | 51/51   | [259–263]             |
| <i>Picornaviridae</i>   | Enterovirus A71           |  | 50%     | 1/2    | [52]      |   | 0–76%   | 165/387  | [43–46,52,264]   | * | 61–100% | 207/301   | [43–46,52,265–267] |   | 0–31%   | 28/290 | [43–46,52,264,266,267] | * | 25–100% | 435/525 | [43–46,52,264–267]    |
| <i>Picornaviridae</i>   | Hepatitis A virus         |  | 12%     | 8/65   | [268]     | * | 68–100% | 105/129  | [47,269–272]     |   | 9–90%   | 14/67     | [268,271]          |   | 0%      | 0/120  | [47]                   | * | 52–100% | 83/119  | [47,269,270,272]      |
| <i>Picornaviridae</i>   | Rhinovirus                |  | -       | -      | -         |   | 0–12%   | 114/1369 | [17,273–276]     | * | 91–100% | 1949/1961 | [17,18,273–281]    |   | 33–100% | 4/10   | [280,282]              |   | 44–100% | 186/295 | [18,280,281]          |
| <i>Pneumoviridae</i>    | HMPV                      |  | 0%      | 0/6    | [22]      |   | 0–41%   | 7/41     | [17,22,283]      | * | 43–100% | 75/87     | [17,18,22,283–287] |   | 0–100%  | 1/7    | [284,286,287]          |   | 0–22%   | 2/15    | [18,22]               |
| <i>Pneumoviridae</i>    | RSV                       |  | 0%      | 0/33   | [22]      |   | 0–40%   | 41/148   | [17,22,288,289]  | * | 63–100% | 381/398   | [17,18,22,288–295] |   | 0–100%  | 2/16   | [290,291,296]          |   | 0–14%   | 5/57    | [18,22]               |
| <i>Retroviridae</i>     | HIV                       |  | 18–40%  | 10/31  | [297,298] | * | 84–100% | 555/569  | [297–309]        |   | 43–100% | 113/145   | [301,302,304–307]  |   | 100%    | 77/77  | [305,308]              |   | 18–95%  | 182/295 | [297,299,300,303,309] |
| <i>Rhabdoviridae</i>    | Rabies virus              |  | 0–50%   | 2/5    | [48,310]  |   | 47%     | 7/15     | [48]             |   | 28–87%  | 71/169    | [48,310–315]       | * | 0–45%   | 26/109 | [48,310–315]           |   | -       | -       | -                     |
| <i>Sedoreoviridae</i>   | Rotavirus                 |  | 80%     | 4/5    | [316]     |   | 0–99%   | 243/326  | [49,317–323]     |   | 10–100% | 396/574   | [16,49,324]        |   | 38–88%  | 17/24  | [49,317,320]           | * | 19–100% | 817/890 | [16,49,316,318–324]   |
| <i>Spinareoviridae</i>  | Colorado tick fever virus |  | -       | -      | -         | * | 100%    | 11/11    | [325]            |   | -       | -         | -                  |   | -       | -      | -                      |   | -       | -       | -                     |
| <i>Tobaniviridae</i>    | Torovirus                 |  | -       | -      | -         |   | -       | -        | -                |   | -       | -         | -                  |   | -       | -      | -                      |   | 100%    | 18/18   | [326]                 |
| <i>Togaviridae</i>      | Chikungunya virus         |  | 23%     | 35/152 | [327]     | * | 0–80%   | 138/277  | [20,146,327–329] |   | 30%     | 46/152    | [327]              |   | 11–100% | 15/70  | [20,146,327–329]       |   | -       | -       | -                     |
| <i>Togaviridae</i>      | Sindbis virus             |  | -       | -      | -         | * | 0–100%  | 31/166   | [330–334]        |   | -       | -         | -                  |   | 0%      | 0/1    | [335]                  |   | -       | -       | -                     |

D: overall detectability estimate. Dark green: high detectability (>75%); light green: medium detectability (25–75%); yellow: low detectability (<25%); red: very low detectability/undetectable (<5%); hatched shading: uncertain estimate; grey: non-existent literature; Range: range from lowest included to highest of included studies' average detectability of confirmed cases out of total cases reported; Ref: references of included studies; C<sub>d</sub>: detected patient cases; C<sub>c</sub>: total confirmed cases.  
\* Reference specimen.



**Figure 2.** Pooled detectability estimates across specimen types. Bars represent pooled detectability calculated from cumulative detected cases ( $C_d$ ) divided by cumulative tested cases ( $C_t$ ). Whiskers indicate the range of study-level detectability estimates. Open bars indicate virus-specimen combinations supported by sparse evidence. Yellow diamond indicates specimen commonly used as reference specimen. Abbreviations: Resp; respiratory specimens.

Ebola virus detection used blood as the reference standard, but detection was also frequent across other specimen types, though systematic assessment was limited by general outbreak conditions (Table 1) [4].

In the new *Hepaciviridae*, for hepatitis C virus, blood was the reference standard and the other four specimen types appeared as possible alternative options—although data was conflicting [36,172,173,179].

*Flaviviridae* used blood as the reference standard specimen for the included viruses. Tick-borne encephalitis (TBE) virus was found with sparse data on NAAT detectability, with testing rarely performed outside blood and CSF and positive findings in non-blood specimens reported infrequently ( $C_d/C_t$ : 13/281, 1/220) [37,151,153]. In contrast, Zika virus and dengue virus were comprehensively studied in large cohorts and demonstrated consistently broad detectability across specimen types, indicating that urine and saliva as alternatives to blood are clearly possible (Figure 2) [38,155,162]. For both viruses, blood and occasionally saliva showed high detectability early in the course of infection, whereas, for dengue virus, urine consistently exhibited lower detectability initially but remained detectable for a longer duration than other specimens [38,135,139,143–145,162,164]. However, compared with Zika virus, dengue virus was only assessed to a limited extent in fecal specimens across the available literature [137].

For *Hantaviridae*, Andes virus and Puumala virus were included and blood was the reference standard for both. Urine and respiratory specimens appear supplementary but inferior options (Table 1) with fecal or CSF specimens were never described [167–169].

*Hepeviridae*'s hepatitis E virus displayed high detectability in both blood and fecal specimens, which were interchangeably used as the reference standard. Detection in other materials was infrequent and typically single-case.

*Matonaviridae*'s rubella virus was most consistently identified in respiratory specimens (Range: 25–95%), with urine and blood appearing very useable despite large variation in reported findings (Range: 14–87%, 11–85%).

For *Nairoviridae*'s Crimean-Congo hemorrhagic fever (CCHF) virus, blood was the reference standard, yet RNA was varyingly detected across urine ( $C_d/C_t$ : 15/18), respiratory ( $C_d/C_t$ : 15/18), and fecal samples ( $C_d/C_t$ : 11/18), suggesting broader shedding potential in the few published studies.

Among *Orthomyxoviridae*, influenza A virus and influenza B virus used respiratory specimens as the reference standard. Influenza A virus had substantial variability in urine (Range: 0–100%), blood (Range: 0–86%), and fecal (Range: 6–89%) findings. Conversely, influenza B virus was across few studies only examined in respiratory and fecal specimens, with the latter having poor detectability (Range: 18–28%) [18,210].

*Paramyxoviridae* similarly relied primarily on respiratory specimens for detection. Measles virus and mumps virus inherently suffered in inclusion due to the prevalence of the MMR vaccine. While mumps virus had few outbreaks large enough for proper examination, measles virus had sufficient spread in populations to allow for thorough mapping with multiple options for NAAT (Figure 2). Urine (Range: 67–77%) appears at minimum on par with blood and respiratory specimen for measles virus detection. Nipah viruses were sparsely reported, likely due to the same factors that affect *Filoviruses* and similar viruses. However, from the limited data all examined body sites appear options for testing [241–244]. Human parainfluenza viruses were too sparsely reported but have been attempted in small-scale fecal samples and blood [17,18].

For *Peribunyaviridae* and Oropouche virus, available evidence is largely restricted to the blood reference standard, with a few case reports examining RNA presence in urine, CSF, and respiratory specimens.

*Phenuiviridae* studies were sparse and confined solely to blood detection.

*Picobirnaviridae* research was found to focus on fecal detection in diarrheal cases with clear association to disease not yet established (Table 1).

*Picornaviridae* are generally well characterized as a group. For Enterovirus A71 a consistent reference was not used and RNA were detected in all specimen types, with the highest rates in fecal ( $C_d/C_t$ : 435–525) and respiratory specimens ( $C_d/C_t$ : 207–301). Rhinovirus used respiratory specimens as the reference standard with moderate fecal specimen detectability ( $C_d/C_t$ : 186/295) and blood appearing a poor option ( $C_d/C_t$ : 114/1369).

Hepatitis A virus used blood and fecal specimens interchangeably as reference standards with only respiratory samples appearing an alternative option ( $C_d/C_t$ : 14/67).

For *Pneumoviridae* respiratory specimens were used as the reference standard and other specimens were rarely examined—no notable alternatives appear from these studies (Table 1) [22].

HIV used blood as the reference standard and was detectable in all examined specimen types, consistent with its systemic nature. HIV was always detected in CSF in the few studies we included that examined the specimen ( $C_d/C_t$ : 77/77) [305,308]. Urine and, to a lesser extent, fecal specimens were the least studied and poorest options (Table 1 and Figure 2).

Within *Rhabdoviridae* rabies virus detection relied primarily on saliva and CSF, with post-mortem brain tissue often acting as reference standard—other body sites were sparse and/or non-existent in the literature (Table 1).

*Sedoreoviridae* and rotavirus were extensively characterized with fecal specimen as reference. Detection was described in all body sites, with blood and respiratory specimens having variable but moderate values ( $C_d/C_t$ : 243/326, 396/574). Colorado tick fever virus was reported on sparsely and only in blood [325].

*Tobamiviridae* was poorly described, with a single PCR study detecting RNA in diarrheal stool [326].

Finally, within *Togaviridae*, chikungunya virus used blood PCR as the reference standard and was examined across serum, urine, and saliva in a large cohort study [327]. Sindbis virus, though historically present in Northern Europe and Russia, was only detected in blood using NAAT and remains underreported. Serological confirmation or skin biopsy PCR were interchangeably reference standards and allowed for more clear estimates of blood NAAT useability values in the absence of other body sites ( $C_d/C_t$ : 31/166).

## 4. Discussion

As a scoping review, the objective was to map the breadth and distribution of evidence rather than generate pooled estimates of diagnostic performance or comparative accuracy between specimen types.

Previous reviews on viral detectability have attempted similar mappings of the literature across various groups of viruses; however, the reviews are very often limited to a small select handful—often viruses with similar symptomatology. During the COVID-19 pandemic, Cevik et al 2021 reported an in-depth analysis of the literature across the three most recently outbreak-related coronaviruses [6]. This scale allowed for more detailed analysis on estimates such as mean shedding duration across specimen types. Lowry et al 2023 attempted a similar mapping of the literature on common respiratory viruses and their shedding profiles in human patients—although on a smaller scale. In that study the focus was more to improve the patient estimates from wastewater virus concentrations rather than creating an overview of viral families [336].

Across the examined RNA virus families, patterns of detectability varied considerably between specimen type, although certain consistent patterns emerged. Sixteen viruses had studies assessing NAAT detectability across all five specimen categories included in this review (Tables 1 and S3). In contrast, several viruses were characterized by limited evidence, reflected by a low number of studies, small cumulative sample sizes, and/or restricted diversity of specimen types examined. These included Lassa virus, human astrovirus, Borna disease virus, sapovirus, HCoV, influenza B virus, Nipah virus, human parainfluenza virus, picobirnavirus, Sindbis virus, torovirus, Colorado tick fever virus, Rift Valley fever virus and enterovirus A71 (Table 1 and Figure 2).

The reasons for these evidence gaps likely differ between viruses. For outbreak-associated viruses such as Lassa virus, Nipah virus, and Ebola virus limited data may reflect

sporadic outbreaks, biosafety requirements, high mortality, and concentration of cases in resource-constrained settings [4,337–339]. For Ebola virus specifically, much of the detailed literature on viral persistence and shedding concerns convalescent patients and therefore fell outside the scope of the present review [340,341]. In contrast, TBE virus illustrates how disease biology may limit NAAT-based investigations, as its brief viremic phase is often followed by neurological manifestations weeks after viral clearance, reducing the utility of molecular diagnostics and likely contributing to the sparse detectability data identified here [342,343]. Human parainfluenza virus and similar respiratory viruses were primarily examined in respiratory panel surveillance studies, where relatively mild disease, underdiagnosis, competition for research funding, and the absence of licensed antiviral therapies may have limited broader investigation [344–346]. Finally, for Borna disease virus, previously contested reports linking viral detection to psychiatric illness in cross-sectional screenings of otherwise healthy individuals were excluded based on the review eligibility criteria [347,348].

Not all evidence gaps were confined to rare or neglected viruses. Even among several well-studied viruses commonly investigated in resource-rich settings, data on NAAT detectability in urine were sparse or entirely absent despite the ease and non-invasive nature of specimen collection. Examples include norovirus, hepatitis E virus, HMPV, and RSV (Table 1). This suggests that specimen selection in virological research may often be guided by established diagnostic practice rather than systematic evaluation of alternative specimen types.

For a certain group of viruses with no natural convalescent period longitudinal sampling served other purposes than measuring speed of clearance—examples include hepatitis C virus, HIV, and rabies virus. For rabies virus, and the other viruses historically, the continued worsening, lack of treatment and often resource-poor setting makes duration of shedding irrelevant and relegates body site clearance monitoring to a solely academic exercise [349]. Another inherent limitation in the HIV inclusion is that older studies with cases untreated over long periods or debut cases never having received treatment met exclusion criteria for immunosuppression—this limited study inclusion to patients from resource-poor settings without access to antiretroviral therapy (ART), studies from the pre-ART era or acute HIV patients.

Figure 2 illustrates substantial variation in detectability patterns across viruses and specimen types. For several viruses, including rotavirus, Nipah virus, Ebola virus, Lassa virus and Zika virus, detectability was generally high across multiple specimen types, whereas respiratory viruses such as influenza A virus, influenza B virus, RSV, HMPV, SARS-CoV-2 and HCoVs showed greater differences between specimen types. Wide ranges for some virus–specimen combinations reflect considerable between-study heterogeneity.

The five specimen types included in this review were selected based on their clinical relevance and scalability. Specimens such as urine and respiratory material are easily collected and readily implemented in large-scale diagnostic or screening settings. Urine already makes up the largest part of culture-based tests in the clinical microbiology laboratories. Additionally, it can be obtained non-invasively without specialized personnel or facilities and may serve as a route of viral elimination even for pathogens without a primary urogenital focus [2]. Respiratory specimens, such as nasopharyngeal or oropharyngeal swabs, sputum, and saliva are similarly accessible and have been of particular importance in epidemic and pandemic surveillance due to the tropism of historic outbreaks [350].

Blood sampling, although more invasive, is routinely performed for patients with suspected infections in most hospitals, making it a practical diagnostic specimen [2]. Fecal material, while slightly less convenient to collect, remains clinically relevant for enteric

and systemically shedding viruses [351]. In contrast, CSF sampling is invasive and typically reserved for severe or neurologically focused disease. Nevertheless, it remains clinically important for neurotropic infections and was therefore included despite its more limited availability. Other specimen types, such as skin swabs, breast milk, or semen, were not included due to their limited representation in the literature and, for some, the logistical challenges associated with large-scale collection.

Our search strategy permits us to map the detectability of viruses with very different levels of evidence by being able to limit certain single-specimen studies when the amount is very large in order to then collect studies with multiple specimen types and subsequently categorizing the extent to which the patients were examined across multiple specimen types. These approaches ensure that our review remains comprehensive by both having smaller reports available for sparsely described viruses at the same time as not including overwhelming amounts for very well published viruses.

A strength of this paper is the mapping of large studies describing NAAT detection in consecutive sampling of patients across different specimen types, thus lessening the issues of a single specimen as reference standard skewing detection towards 100%. These studies are primarily the 102/319 studies that were graded A in at least two specimens and are the only studies completely unrestricted in study inclusion. The 217 studies of B and C grade studies were included in the absence of A graded studies with multiple patients analyzed in more than one specimen. This was done to improve the accuracy of the detectability by avoiding the single specimen diagnostic reference standard as case confirmation was contingent upon positivity in that specimen. While this arbitrary sectioning limits the statistical capabilities, including the other excluded 2167 studies that were graded B and C in the presence of studies graded A would have been unfeasible. The novel categorizing method employed by this review preserves the under-studied specimen overview and is unlikely to be made another way with this scope.

However, CNS specimens present particular challenges for systematic assessment. Sampling is typically restricted to patients with severe or neurologically focused disease, often in the context of life-threatening illness or diagnostic uncertainty. This introduces a selection bias toward atypical or complicated cases, occasionally compounded by undiagnosed immunodeficiency or rare post-infectious syndromes, making generalization difficult. Moreover, viral RNA detection in CSF is frequently casuistic, reflecting low viral loads or transient CNS involvement. In less severe infections, lumbar puncture is rarely indicated, resulting in a paucity of comparative data. The infrequent collection and limited long-term storage of CSF further constrain its inclusion in standardized diagnostic or research protocols, hindering reproducibility and large-scale evaluation, as exemplified by the limited PCR detectability reported for neurotropic infections such as TBE virus and measles virus. Importantly, detection of viral RNA in CSF does not necessarily imply diagnostic utility. Rather, positivity in CNS specimens may provide insight into neuroinvasion, tissue tropism, or compartment-specific infection, as exemplified by HIV, where CSF RNA detection may reflect central nervous system involvement despite blood remaining the principal specimen for diagnosis and monitoring [352,353].

Post-study inclusion we incorporated the impending taxonomic changes to *Flaviviridae* based on Simmonds et al. 2025 for the included viruses and the suggested new family of *Hepaciviridae* [15]. The other suggested new family of *Pestiviridae* is, to our knowledge, as of yet not relevant in human disease and, as such, not relevant for the scope of the review.

Across the included viruses, significant variations were observed in detection rates among studies using similar specimen types for the same virus. These discrepancies may reflect virus-specific factors or methodological differences, such as variations in nucleic acid extraction methods, assay sensitivity or specificity, viral load (Ct or equivalent

values), positivity thresholds, or the timing of specimen collection relative to disease progression. Another limitation is that NAAT detection in clinical specimens does not identify the cellular source of detected viral nucleic acids. Consequently, detection reflects the presence of viral genetic material within a specimen rather than the specific host cells or biological reservoirs contributing to that signal. Accordingly, this review evaluates specimen-level detectability rather than underlying cellular host interactions. A key limitation of this review is that such details were often poorly reported and, when available, the data were insufficient to allow meaningful comparison or adjustment for these factors. Furthermore, adherence to reporting frameworks such as MIQE was not consistently reported across studies and was therefore not amenable to systematic assessment.

## 5. Conclusions

This review underscores that the diagnostic application of NAATs across specimen types remains highly virus-specific and unevenly explored. For many pathogens, reliance on a single reference specimen—often blood or respiratory material—may overlook viable, less invasive alternatives. Broader validation of specimens such as urine or saliva could improve diagnostic accessibility in outbreak settings and support surveillance where conventional sampling is impractical. Alternative specimen types may also prove valuable in clinically complex situations, including when reference specimens are unavailable, collected outside the optimal diagnostic window, or yield negative results despite ongoing clinical suspicion. In such settings, knowledge of virus-specific detectability patterns across body sites may support diagnostic decision-making and improve case ascertainment. Importantly, knowledge of viral shedding kinetics across specimen types is essential for selecting the appropriate diagnostic test at different stages of disease, but this remains insufficiently defined for many human RNA viruses [354].

The marked heterogeneity between studies highlights the need for standardized reporting of key variables, including sampling timing, extraction methods, assay parameters, and Ct thresholds. Improved methodological transparency would enable cross-study comparability and support quantitative synthesis in future reviews.

Finally, the review identifies substantial evidence gaps for several virus–specimen combinations and limited longitudinal data on viral kinetics. Addressing these gaps through harmonized, cross-specimen studies could refine diagnostic algorithms, enhance outbreak preparedness, and inform future assay development across evolving viral taxonomies.

**Supplementary Materials:** The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/v18070743/s1>, Table S1: PRISMA-ScR checklist; Table S2: Search strings and retrieval numbers; Table S3: Included study list and raw extracted data.

**Author Contributions:** Conceptualization, C.S.I., T.L.K. and U.V.S.; Methodology, C.S.I., T.L.K. and K.B.; Validation, C.S.I., T.L.K. and K.B.; Formal Analysis, C.S.I., T.L.K. and K.B.; Investigation, C.S.I., T.L.K. and K.B.; Data Curation, C.S.I., T.L.K. and K.B.; Writing—Original Draft Preparation, C.S.I.; Writing—Review and Editing, C.S.I., T.L.K., K.B., J.B., J.G.L. and U.V.S.; Visualization, C.S.I.; Supervision, U.V.S., J.B. and J.G.L.; Project Administration, C.S.I.; Funding Acquisition, U.V.S. All authors have read and agreed to the published version of the manuscript.

**Funding:** The work described in this protocol was co-financed through the DURABLE project. The DURABLE project has been co-funded by the European Union, under the EU4Health Programme (EU4H), Project no. 101102733. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or the European Health and Digital Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** The original contributions presented in this study are included in the article/Supplementary Material. Further inquiries can be directed to the corresponding author.

**Conflicts of Interest:** The authors declare no conflicts of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

## Abbreviations

The following abbreviations are used in this manuscript:

NAAT Nucleic acid amplification test

PBMC Peripheral blood mononuclear cells

## Appendix A

**Table A1.** Evidence hierarchy categories.

| Category | Description                                                                                                                                                                |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A        | Above 5 patients AND<br>Multiple specimen types of interest from the same patients AND<br>Consecutive sampling over time from patients untreated with targeted anti-virals |
| B        | Above 5 patients AND<br>Multiple specimen types of interest from the same patients OR<br>Consecutive sampling over time from patients untreated with targeted anti-virals  |
| C        | No sample size requirement. At least one specimen type of interest with or without consecutive sampling.                                                                   |

For each virus and specimen combination, we checked full-text inclusions to identify category A studies. If available, only category A studies were included for that specimen type. If no category A studies were found, category B studies for that specific virus and specimen type were included. If neither category A nor B studies were identified, all full-text inclusions were included as category C studies.

## References

1. Cassedy, A.; Parle-McDermott, A.; O’Kennedy, R. Virus Detection: A Review of the Current and Emerging Molecular and Immunological Methods. *Front. Mol. Biosci.* **2021**, *8*, 637559. <https://doi.org/10.3389/FMOLB.2021.637559>.
2. Niedrig, M.; Patel, P.; El Wahed, A.A.; Schädler, R.; Yactayo, S. Find the Right Sample: A Study on the Versatility of Saliva and Urine Samples for the Diagnosis of Emerging Viruses. *BMC Infect. Dis.* **2018**, *18*, 707. <https://doi.org/10.1186/S12879-018-3611-X>.
3. Hou, N.; Wang, K.; Zhang, H.; Bai, M.; Chen, H.; Song, W.; Jia, F.; Zhang, Y.; Han, S.; Xie, B. Comparison of Detection Rate of 16 Sampling Methods for Respiratory Viruses: A Bayesian Network Meta-Analysis of Clinical Data and Systematic Review. *BMJ Glob. Health* **2020**, *5*, 3053. <https://doi.org/10.1136/BMJGH-2020-003053>.
4. Shorten, R.J.; Brown, C.S.; Jacobs, M.; Rattenbury, S.; Simpson, A.J.; Mepharm, S. Diagnostics in Ebola Virus Disease in Resource-Rich and Resource-Limited Settings. *PLoS Negl. Trop. Dis.* **2016**, *10*, e0004948. <https://doi.org/10.1371/JOURNAL.PNTD.0004948>.
5. Puhach, O.; Meyer, B.; Eckerle, I. SARS-CoV-2 Viral Load and Shedding Kinetics. *Nat. Rev. Microbiol* **2023**, *21*, 147–161. <https://doi.org/10.1038/s41579-022-00822-w>.
6. Cevik, M.; Tate, M.; Lloyd, O.; Maraolo, A.E.; Schafers, J.; Ho, A. SARS-CoV-2, SARS-CoV, and MERS-CoV Viral Load Dynamics, Duration of Viral Shedding, and Infectiousness: A Systematic Review and Meta-Analysis. *Lancet Microbe* **2021**, *2*, e13–e22. [https://doi.org/10.1016/S2666-5247\(20\)30172-5](https://doi.org/10.1016/S2666-5247(20)30172-5).

7. Hagman, K.; Postigo, T.; Diez-Castro, D.; Ursing, J.; Bermejo-Martin, J.F.; de la Fuente, A.; Tedim, A.P. Prevalence and Clinical Relevance of Viraemia in Viral Respiratory Tract Infections: A Systematic Review. *Lancet Microbe* **2025**, *6*, 100967. <https://doi.org/10.1016/j.lanmic.2024.100967>.
8. Woolhouse, M.E.J.; Howey, R.; Gaunt, E.; Reilly, L.; Chase-Topping, M.; Savill, N. Temporal Trends in the Discovery of Human Viruses. *Proc. R. Soc. B Biol. Sci.* **2008**, *275*, 2111–2115. <https://doi.org/10.1098/rspb.2008.0294>.
9. Lu, L.; Zhang, F.; Brierley, L.; Robertson, G.; Chase-Topping, M.; Lycett, S.; Woolhouse, M. Temporal Dynamics, Discovery, and Emergence of Human-Transmissible RNA Viruses. *Mol. Biol. Evol.* **2024**, *41*, msad272. <https://doi.org/10.1093/molbev/msad272>.
10. WHO. *WHO R&D Blueprint for Epidemics*; WHO: Geneva, Switzerland, 2024.
11. Page, M.J.; McKenzie, J.E.; Bossuyt, P.M.; Boutron, I.; Hoffmann, T.C.; Mulrow, C.D.; Shamseer, L.; Tetzlaff, J.M.; Akl, E.A.; Brennan, S.E.; et al. The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews. *BMJ* **2021**, *372*, 71. <https://doi.org/10.1136/bmj.n71>.
12. Tricco, A.C.; Lillie, E.; Zarin, W.; O'Brien, K.K.; Colquhoun, H.; Levac, D.; Moher, D.; Peters, M.D.J.; Horsley, T.; Weeks, L.; et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann. Intern. Med.* **2018**, *169*, 467–473. <https://doi.org/10.7326/M18-0850>.
13. Black, E.J.; Powell, C.S.; Dempsey, D.M.; Hendrickson, R.C.; Mims, L.R.; Lefkowitz, E.J. Virus Taxonomy: The Database of the International Committee on Taxonomy of Viruses. *Nucleic Acids Res.* **2025**, *54*, D776. <https://doi.org/10.1093/NAR/GKAF1159>.
14. Lefkowitz, E.; Hendrickson, R.; International Committee on Taxonomy of Viruses. *ICTV Master Species List (MSL)*; International Committee on Taxonomy of Viruses (ICTV): Birmingham, AL, USA, 2025. <https://doi.org/10.5281/ZENODO.19154110>.
15. Simmonds, P.; Butković, A.; Grove, J.; Mayne, R.; Mifsud, J.C.O.; Beer, M.; Bukh, J.; Drexler, J.F.; Kapoor, A.; Lohmann, V.; et al. Taxonomic Expansion and Reorganization of Flaviviridae. *Nat. Microbiol.* **2025**, *10*, 3026–3037. <https://doi.org/10.1038/s41564-025-02134-0>.
16. Zhuo, R.; Parsons, B.D.; Lee, B.E.; Drews, S.J.; Chui, L.; Louie, M.; Crago, B.; Freedman, S.B.; Ali, S.; Pang, X. Identification of Enteric Viruses in Oral Swabs from Children with Acute Gastroenteritis. *J. Mol. Diagn.* **2018**, *20*, 56–62. <https://doi.org/10.1016/j.jmoldx.2017.09.003>.
17. Proenca-Modena, J.L.; Valera, F.C.P.; Jacob, M.G.; Buzatto, G.P.; Saturno, T.H.; Lopes, L.; Souza, J.M.; Paula, F.E.; Silva, M.L.; Carenzi, L.R.; et al. High Rates of Detection of Respiratory Viruses in Tonsillar Tissues from Children with Chronic Adenotonsillar Disease. *PLoS ONE* **2012**, *7*, e42136. <https://doi.org/10.1371/journal.pone.0042136>.
18. Minodier, L.; Masse, S.; Capai, L.; Blanchon, T.; Ceccaldi, P.-E.; van der Werf, S.; Hanslik, T.; Charrel, R.; Falchi, A. Clinical and Virological Factors Associated with Gastrointestinal Symptoms in Patients with Acute Respiratory Infection: A Two-Year Prospective Study in General Practice Medicine. *BMC Infect. Dis.* **2017**, *17*, 729. <https://doi.org/10.1186/s12879-017-2823-9>.
19. Portal, T.M.; Reymão, T.K.A.; Quinderé Neto, G.A.; Fiuza, M.K.D.C.; Teixeira, D.M.; Lima, I.C.G.; Sousa Júnior, E.C.; Bandeira, R.D.S.; De Deus, D.R.; Justino, M.C.A.; et al. Detection and Genotyping of Enteric Viruses in Hospitalized Children with Acute Gastroenteritis in Belém, Brazil: Occurrence of Adenovirus Viremia by Species F, Types 40/41. *J. Med. Virol.* **2019**, *91*, 378–384. <https://doi.org/10.1002/jmv.25321>.
20. Brito Ferreira, M.L.; Militão de Albuquerque, M.D.F.P.; de Brito, C.A.A.; de Oliveira França, R.F.; Porto Moreira, Á.J.; de Moraes Machado, M.Í.; da Paz Melo, R.; Medialdea-Carrera, R.; Dornelas Mesquita, S.; Lopes Santos, M.; et al. Neurological Disease in Adults with Zika and Chikungunya Virus Infection in Northeast Brazil: A Prospective Observational Study. *Lancet Neurol.* **2020**, *19*, 826–839. [https://doi.org/10.1016/S1474-4422\(20\)30232-5](https://doi.org/10.1016/S1474-4422(20)30232-5).
21. Dashti, A.S.; Khalifeh, M.; Yousefifar, E.; Kadivar, M.R.; Jamalidoust, M.; Namayandeh, M.; Abdinia, B. The Prevalence of Viruses in the Cerebrospinal Fluid of Children with Aseptic Meningitis in Shiraz, Iran. *Arch. Clin. Infect. Dis.* **2020**, *15*, 1–6. <https://doi.org/10.5812/archcid.100850>.
22. Von Linstow, M.-L.; Eugen-Olsen, J.; Koch, A.; Winther, T.N.; Westh, H.; Høgh, B. Excretion Patterns of Human Metapneumovirus and Respiratory Syncytial Virus among Young Children. *Eur. J. Med. Res.* **2006**, *11*, 329–335.
23. Belaunzarán-Zamudio, P.F.; Rincón León, H.A.; Caballero Sosa, S.; Ruiz, E.; Nájera Cancino, J.G.; de La Rosa, P.R.; Guerrero Almeida, M.L.; Powers, J.H.; Beigel, J.H.; Hunsberger, S.; et al. Different Epidemiological Profiles in Patients with Zika and Dengue Infection in Tapachula, Chiapas in Mexico (2016–2018): An Observational, Prospective Cohort Study. *BMC Infect. Dis.* **2021**, *21*, 881. <https://doi.org/10.1186/s12879-021-06520-x>.
24. Corman, V.M.; Albarak, A.M.; Omrani, A.S.; Albarak, M.M.; Farah, M.E.; Almasri, M.; Muth, D.; Sieberg, A.; Meyer, B.; Assiri, A.M.; et al. Viral Shedding and Antibody Response in 37 Patients with Middle East Respiratory Syndrome Coronavirus Infection. *Clin. Infect. Dis.* **2016**, *62*, 477–483. <https://doi.org/10.1093/cid/civ951>.

25. Al-Abdely, H.M.; Midgley, C.M.; Alkhamis, A.M.; Abedi, G.R.; Lu, X.; Binder, A.M.; Alanazi, K.H.; Tamin, A.; Banjar, W.M.; Lester, S.; et al. Middle East Respiratory Syndrome Coronavirus Infection Dynamics and Antibody Responses among Clinically Diverse Patients, Saudi Arabia. *Emerg. Infect. Dis.* **2019**, *25*, 753–766. <https://doi.org/10.3201/eid2504.181595>.
26. Zheng, S.; Fan, J.; Yu, F.; Feng, B.; Lou, B.; Zou, Q.; Xie, G.; Lin, S.; Wang, R.; Yang, X.; et al. Viral Load Dynamics and Disease Severity in Patients Infected with SARS-CoV-2 in Zhejiang Province, China, January–March 2020: Retrospective Cohort Study. *BMJ* **2020**, *369*, m1443. <https://doi.org/10.1136/bmj.m1443>.
27. Young, B.E.; Ong, S.W.X.; Kalimuddin, S.; Low, J.G.; Tan, S.Y.; Loh, J.; Ng, O.-T.; Marimuthu, K.; Ang, L.W.; Mak, T.M.; et al. Epidemiologic Features and Clinical Course of Patients Infected with SARS-CoV-2 in Singapore. *JAMA* **2020**, *323*, 1488–1494. <https://doi.org/10.1001/jama.2020.3204>.
28. Kim, J.-M.; Kim, H.M.; Lee, E.J.; Jo, H.J.; Yoon, Y.; Lee, N.-J.; Son, J.; Lee, Y.-J.; Kim, M.S.; Lee, Y.-P.; et al. Original Article Detection and Isolation of SARS-CoV-2 in Serum, Urine, and Stool Specimens of COVID-19 Patients from the Republic of Korea. *Osong Public Health Res. Perspect.* **2020**, *11*, 112–117. <https://doi.org/10.24171/j.phrp.2020.11.3.02>.
29. Lescure, F.-X.; Bouadma, L.; Nguyen, D.; Parisey, M.; Wicky, P.-H.; Behillil, S.; Gaymard, A.; Bouscambert-Duchamp, M.; Donati, F.; Le Hingrat, Q.; et al. Clinical and Virological Data of the First Cases of COVID-19 in Europe: A Case Series. *Lancet Infect. Dis.* **2020**, *20*, 697–706. [https://doi.org/10.1016/S1473-3099\(20\)30200-0](https://doi.org/10.1016/S1473-3099(20)30200-0).
30. Kujawski, S.A.; Wong, K.K.; Collins, J.P.; Epstein, L.; Killerby, M.E.; Midgley, C.M.; Abedi, G.R.; Ahmed, N.S.; Almendares, O.; Alvarez, F.N.; et al. Clinical and Virologic Characteristics of the First 12 Patients with Coronavirus Disease 2019 (COVID-19) in the United States. *Nat. Med.* **2020**, *26*, 861–868. <https://doi.org/10.1038/s41591-020-0877-5>.
31. Cai, J.; Wang, X.; Zhao, J.; Ge, Y.; Xu, J.; Tian, H.; Chang, H.; Xia, A.; Wang, J.; Zhang, J.; et al. Comparison of Clinical and Epidemiological Characteristics of Asymptomatic and Symptomatic SARS-CoV-2 Infection in Children. *Virol. Sin.* **2020**, *35*, 803–810. <https://doi.org/10.1007/s12250-020-00312-4>.
32. Yuan, C.; Wang, H.; Li, K.; Tang, A.; Dai, Y.; Wu, B.; Zhang, H.; Chen, J.; Liu, J.; Wu, W.; et al. SARS-CoV-2 Viral Shedding Characteristics and Potential Evidence for the Priority for Faecal Specimen Testing in Diagnosis. *PLoS ONE* **2021**, *16*, e0247367. <https://doi.org/10.1371/journal.pone.0247367>.
33. Joukar, F.; Yaghubi Kalurazi, T.; Khoshsorour, M.; Taramian, S.; Mahfoozi, L.; Balou, H.A.; Jafarinezhad, A.; Pourkazemi, A.; Hesni, E.; Asgharnezhad, M.; et al. Persistence of SARS-CoV-2 RNA in the Nasopharyngeal, Blood, Urine, and Stool Samples of Patients with COVID-19: A Hospital-Based Longitudinal Study. *Virol. J.* **2021**, *18*, 134. <https://doi.org/10.1186/s12985-021-01599-9>.
34. Howlett, P.; Brown, C.; Helderman, T.; Brooks, T.; Lisk, D.; Deen, G.; Solbrig, M.; Lado, M. Ebola Virus Disease Complicated by Late-Onset Encephalitis and Polyarthritits, Sierra Leone. *Emerg. Infect. Dis.* **2016**, *22*, 150–152. <https://doi.org/10.3201/eid2201.151212>.
35. Bausch, D.G.; Towner, J.S.; Dowell, S.F.; Kaducu, F.; Lukwiya, M.; Sanchez, A.; Nichol, S.T.; Ksiazek, T.G.; Rollin, P.E. Assessment of the Risk of Ebola Virus Transmission from Bodily Fluids and Fomites. *J. Infect. Dis.* **2007**, *196*, S142–S147. <https://doi.org/10.1086/520545>.
36. Hsu, H.H.; Wright, T.L.; Luba, D.; Martin, M.; Feinstone, S.M.; Garcia, G.; Greenberg, H.B. Failure to Detect Hepatitis C Virus Genome in Human Secretions with the Polymerase Chain Reaction. *Hepatology* **1991**, *14*, 763–767. <https://doi.org/10.1002/hep.1840140504>.
37. Veje, M.; Studahl, M.; Johansson, M.; Johansson, P.; Nolskog, P.; Bergström, T. Diagnosing Tick-Borne Encephalitis: A Re-Evaluation of Notified Cases. *Eur. J. Clin. Microbiol. Infect. Dis.* **2018**, *37*, 339–344. <https://doi.org/10.1007/s10096-017-3139-9>.
38. Calvet, G.A.; Kara, E.O.; Bôtto-Menezes, C.H.A.; Castilho, M.d.C.; Franca, R.F.d.O.; Habib, N.; Neto, A.M.; Pereira, G.F.M.; Gi-ozza, S.P.; Bermúdez, X.P.D.; et al. Detection and Persistence of Zika Virus in Body Fluids and Associated Factors: A Prospective Cohort Study. *Sci. Rep.* **2023**, *13*, 21557. <https://doi.org/10.1038/s41598-023-48493-8>.
39. Yagci-Caglayik, D.; Kayaaslan, B.; Yapar, D.; Kocagul-Celikbas, A.; Ozkaya-Parlakay, A.; Emek, M.; Baykam, N.; Tezer, H.; Korukluoglu, G.; Ozkul, A. Monitoring Crimean-Congo Haemorrhagic Fever Virus RNA Shedding in Body Secretions and Serological Status in Hospitalised Patients, Turkey, 2015. *Eurosurveillance* **2020**, *25*, 1900284. <https://doi.org/10.2807/1560-7917.ES.2020.25.10.1900284>.
40. Zhu, Z.; Liu, Y.; Xu, L.; Guan, W.; Zhang, X.; Qi, T.; Shi, B.; Song, Z.; Liu, X.; Wan, Y.; et al. Extra-Pulmonary Viral Shedding in H7N9 Avian Influenza Patients. *J. Clin. Virol.* **2015**, *69*, 30–32. <https://doi.org/10.1016/j.jcv.2015.05.013>.
41. To, K.K.W.; Chan, K.; Li, I.W.S.; Tsang, T.; Tse, H.; Chan, J.F.W.; Hung, I.F.N.; Lai, S.; Leung, C.; Kwan, Y.; et al. Viral Load in Patients Infected with Pandemic H1N1 2009 Influenza A Virus. *J. Med. Virol.* **2010**, *82*, 1–7. <https://doi.org/10.1002/jmv.21664>.

42. Hu, Y.; Lu, S.; Song, Z.; Wang, W.; Hao, P.; Li, J.; Zhang, X.; Yen, H.-L.; Shi, B.; Li, T.; et al. Association between Adverse Clinical Outcome in Human Disease Caused by Novel Influenza A H7N9 Virus and Sustained Viral Shedding and Emergence of Anti-viral Resistance. *Lancet* **2013**, *381*, 2273–2279. [https://doi.org/10.1016/S0140-6736\(13\)61125-3](https://doi.org/10.1016/S0140-6736(13)61125-3).
43. Li, C.-C.; Yang, M.-Y.; Chen, R.-F.; Lin, T.-Y.; Tsao, K.-C.; Ning, H.-C.; Liu, H.-C.; Lin, S.-F.; Yeh, W.-T.; Chu, Y.-T.; et al. Clinical Manifestations and Laboratory Assessment in an Enterovirus 71 Outbreak in Southern Taiwan. *Scand. J. Infect. Dis.* **2002**, *34*, 104–109. <https://doi.org/10.1080/00365540110077119>.
44. Tsai, J.-D.; Tsai, H.J.; Lin, T.-H.; Chang, Y.-Y.; Yang, S.-H.; Kuo, H.-T. Comparison of the Detection Rates of RT-PCR and Virus Culture Using a Combination of Specimens from Multiple Sites for Enterovirus-Associated Encephalomyelitis during Enterovirus 71 Epidemic. *Jpn J. Infect. Dis.* **2014**, *67*, 333–338. <https://doi.org/10.7883/yoken.67.333>.
45. Leon, K.E.; Schubert, R.D.; Casas-Alba, D.; Hawes, I.A.; Ramachandran, P.S.; Ramesh, A.; Pak, J.E.; Wu, W.; Cheung, C.K.; Crawford, E.D.; et al. Genomic and Serologic Characterization of Enterovirus A71 Brainstem Encephalitis. *Neurol. Neuroimmunol. Neuroinflamm.* **2020**, *7*, e703. <https://doi.org/10.1212/NXI.0000000000000703>.
46. Zhou, Y.; Zhou, C.; Wang, K.; Qiu, Q.; Cheng, Y.; Li, Y.; Cui, P.; Liang, L.; Li, P.; Deng, X.; et al. Diagnostic Performance of Different Specimens in Detecting Enterovirus A71 in Children with Hand, Foot and Mouth Disease. *Virol. Sin.* **2023**, *38*, 268–275. <https://doi.org/10.1016/j.virs.2022.11.004>.
47. Joshi, M.S.; Tandale, B.V.; Gore, M.M.; Bhalla, S.; Gurav, Y.K.; Sapkal, G.N.; Kushwaha, K.P.; Mishra, A.C.; Chitambar, S.D. Evidence of Hepatitis A Virus Infection in the Patients with Acute Encephalitis Syndrome in Gorakhpur Region, North India. *Acta Virol.* **2018**, *62*, 208–213. [https://doi.org/10.4149/av\\_2018\\_215](https://doi.org/10.4149/av_2018_215).
48. Li, H.; Liu, J.-J.; Ding, S.-J.; Cai, L.; Feng, Y.; Yu, P.-C.; Liu, S.-Q.; Lu, X.-X.; Tao, X.-Y.; Zhu, W.-Y. Human Rabies in China: Evidence-Based Suggestions for Improved Case Detection and Data Gathering. *Infect. Dis. Poverty* **2020**, *9*, 60. <https://doi.org/10.1186/s40249-020-00672-9>.
49. Ushijima, H.; Xin, K.-Q.; Nishimura, S.; Morikawa, S.; Abe, T. Detection and Sequencing of Rotavirus VP7 Gene from Human Materials (Stools, Sera, Cerebrospinal Fluids, and Throat Swabs) by Reverse Transcription and PCR. *J. Clin. Microbiol.* **1994**, *32*, 2893–2897. <https://doi.org/10.1128/jcm.32.12.2893-2897.1994>.
50. Grosse, L.; Lieftüchter, V.; Vollmuth, Y.; Hoffmann, F.; Olivieri, M.; Reiter, K.; Tacke, M.; Heinen, F.; Borggraefe, I.; Osterman, A.; et al. First Detected Geographical Cluster of BoDV-1 Encephalitis from Same Small Village in Two Children: Therapeutic Considerations and Epidemiological Implications. *Infection* **2023**, *51*, 1383–1398. <https://doi.org/10.1007/s15010-023-01998-w>.
51. Yu, L.; Wang, Z.; Chen, Y.; Ding, W.; Jia, H.; Chan, J.F.-W.; To, K.K.-W.; Chen, H.; Yang, Y.; Liang, W.; et al. Clinical, Virological, and Histopathological Manifestations of Fatal Human Infections by Avian Influenza A(H7N9) Virus. *Clin. Infect. Dis.* **2013**, *57*, 1449–1457. <https://doi.org/10.1093/cid/cit541>.
52. Pérez-Vélez, C.M.; Anderson, M.S.; Robinson, C.C.; McFarland, E.J.; Nix, W.A.; Pallansch, M.A.; Oberste, M.S.; Glodé, M.P. Outbreak of Neurologic Enterovirus Type 71 Disease: A Diagnostic Challenge. *Clin. Infect. Dis.* **2007**, *45*, 950–957. <https://doi.org/10.1086/521895>.
53. Jevšnik, M.; Steyer, A.; Zrim, T.; Pokorn, M.; Mrvič, T.; Grosek, Š.; Strle, F.; Lusa, L.; Petrovec, M. Detection of Human Coronaviruses in Simultaneously Collected Stool Samples and Nasopharyngeal Swabs from Hospitalized Children with Acute Gastroenteritis. *Virol. J.* **2013**, *10*, 46. <https://doi.org/10.1186/1743-422X-10-46>.
54. Paloniemi, M.; Lappalainen, S.; Vesikari, T. Commonly Circulating Human Coronaviruses Do Not Have a Significant Role in the Etiology of Gastrointestinal Infections in Hospitalized Children. *J. Clin. Virol.* **2015**, *62*, 114–117. <https://doi.org/10.1016/j.jcv.2014.10.017>.
55. Lunkenheimer, K.; Hufert, F.T.; Schmitz, H. Detection of Lassa Virus RNA in Specimens from Patients with Lassa Fever by Using the Polymerase Chain Reaction. *J. Clin. Microbiol.* **1990**, *28*, 2689–2692. <https://doi.org/10.1128/jcm.28.12.2689-2692.1990>.
56. Choi, M.J.; Worku, S.; Knust, B.; Vang, A.; Lynfield, R.; Mount, M.R.; Objio, T.; Brown, S.; Griffith, J.; Hulbert, D.; et al. A Case of Lassa Fever Diagnosed at a Community Hospital-Minnesota 2014. *Open Forum Infect. Dis.* **2018**, *5*, ofy131. <https://doi.org/10.1093/ofid/ofy131>.
57. Raabe, V.N.; Kann, G.; Ribner, B.S.; Andres, A.M.; Varkey, J.B.; Mehta, A.K.; Lyon, G.M.; Vanairsdale, S.; Faber, K.; Becker, S.; et al. Favipiravir and Ribavirin Treatment of Epidemiologically Linked Cases of Lassa Fever. *Clin. Infect. Dis.* **2017**, *65*, 855–859. <https://doi.org/10.1093/cid/cix406>.
58. Okokhere, P.O.; Erameh, C.O.; Alikah, F.; Akhideno, P.E.; Iruolagbe, C.O.; Osazuwa, O.O.; Bankole, I.A.; Adomeh, D.I.; Odia, I.; Aire, C.O.; et al. Acute Lassa Virus Encephalitis with Lassa Virus in the Cerebrospinal Fluid but Absent in the Blood: A Case Report with a Positive Outcome. *Case Rep. Neurol.* **2018**, *10*, 159–164. <https://doi.org/10.1159/000490374>.

59. Demby, A.H.; Chamberlain, J.; Brown, D.W.G.; Clegg, C.S. Early Diagnosis of Lassa Fever by Reverse Transcription-PCR. *J. Clin. Microbiol.* **1994**, *32*, 2898–2903. <https://doi.org/10.1128/jcm.32.12.2898-2903.1994>.
60. Vieth, S.; Drosten, C.; Lenz, O.; Vincent, M.; Omilabu, S.; Hass, M.; Becker-Ziaja, B.; ter Meulen, J.; Nichol, S.T.; Schmitz, H.; et al. RT-PCR Assay for Detection of Lassa Virus and Related Old World Arenaviruses Targeting the L Gene. *Trans. R. Soc. Trop. Med. Hyg.* **2007**, *101*, 1253–1264. <https://doi.org/10.1016/j.trstmh.2005.03.018>.
61. Cordey, S.; Zanella, M.-C.; Wagner, N.; Turin, L.; Kaiser, L. Novel Human Astroviruses in Pediatric Respiratory Samples: A One-Year Survey in a Swiss Tertiary Care Hospital. *J. Med. Virol.* **2018**, *90*, 1775–1778. <https://doi.org/10.1002/jmv.25246>.
62. Mitchell, D.K.; Monroe, S.S.; Jiang, X.; Matson, D.O.; Glass, R.I.; Pickering, L.K. Virologic Features of an Astrovirus Diarrhea Outbreak in a Day Care Center Revealed by Reverse Transcriptase-Polymerase Chain Reaction. *J. Infect. Dis.* **1995**, *172*, 1437–1444.
63. Mitchell, D.K.; Van, R.; Morrow, A.L.; Monroe, S.S.; Glass, R.I.; Pickering, L.K. Outbreaks of Astrovirus Gastroenteritis in Day Care Centers. *J. Pediatr.* **1993**, *123*, 725–732. [https://doi.org/10.1016/S0022-3476\(05\)80846-7](https://doi.org/10.1016/S0022-3476(05)80846-7).
64. Heinemann, M.; Strauchs, C.; Lütgehetmann, M.; Aepfelbacher, M.; Klupp, E.-M.; Owusu-Dabo, E.; Rolling, T.; Cramer, J.P.; Vinnemeier, C.D. Polymicrobial Enteric Infections in African Infants with Diarrhoea—Results from a Longitudinal Prospective Case–Control Study. *Clin. Microbiol. Infect.* **2021**, *27*, 1792–1798. <https://doi.org/10.1016/j.cmi.2021.03.020>.
65. Niller, H.H.; Angstwurm, K.; Rubbenstroth, D.; Schlottau, K.; Ebinger, A.; Giese, S.; Wunderlich, S.; Banas, B.; Forth, L.F.; Hoffmann, D.; et al. Zoonotic Spillover Infections with Borna Disease Virus 1 Leading to Fatal Human Encephalitis, 1999–2019: An Epidemiological Investigation. *Lancet Infect. Dis.* **2020**, *20*, 467–477. [https://doi.org/10.1016/S1473-3099\(19\)30546-8](https://doi.org/10.1016/S1473-3099(19)30546-8).
66. Bauswein, M.; Eid, E.; Eidenschink, L.; Schmidt, B.; Gessner, A.; Tappe, D.; Cadar, D.; Böhmer, M.M.; Jockel, L.; van Wickeren, N.; et al. Detection of Virus-Specific T Cells via ELISpot Corroborates Early Diagnosis in Human Borna Disease Virus 1 (BoDV-1) Encephalitis. *Infection* **2024**, *52*, 1663–1670. <https://doi.org/10.1007/s15010-024-02246-5>.
67. Ito, S.; Takeshita, S.; Nezu, A.; Aihara, Y.; Usuku, S.; Noguchi, Y.; Yokota, S. Norovirus-Associated Encephalopathy. *Pediatr. Infect. Dis. J.* **2006**, *25*, 651–652. <https://doi.org/10.1097/01.inf.0000225789.92512.6d>.
68. Obinata, K.; Okumura, A.; Nakazawa, T.; Kamata, A.; Niizuma, T.; Kinoshita, K.; Shimizu, T. Norovirus Encephalopathy in A Previously Healthy Child. *Pediatr. Infect. Dis. J.* **2010**, *29*, 1057–1059. <https://doi.org/10.1097/INF.0b013e3181e78889>.
69. Huhti, L.; Hemming-Harlow, M.; Vesikari, T. Norovirus Detection from Sera of Young Children with Acute Norovirus Gastroenteritis. *J. Clin. Virol.* **2016**, *79*, 6–9. <https://doi.org/10.1016/j.jcv.2016.03.021>.
70. Reymão, T.K.A.; Fumian, T.M.; Justino, M.C.A.; Hernandez, J.M.; Bandeira, R.S.; Lucena, M.S.S.; Teixeira, D.M.; Farias, F.P.; Silva, L.D.; Linhares, A.C.; et al. Norovirus RNA in Serum Associated with Increased Fecal Viral Load in Children: Detection, Quantification and Molecular Analysis. *PLoS ONE* **2018**, *13*, e0199763. <https://doi.org/10.1371/journal.pone.0199763>.
71. Amexo, J.X.; Negoro, M.; Kuurdor, E.D.-M.; Lartey, B.L.; Sokejima, S.; Sugata, K.; Taniguchi, K. Molecular Epidemiology of Norovirus (NoV) Infection in Mie Prefecture: The Kinetics of Norovirus Antigenemia in Pediatric Patients. *Viruses* **2022**, *14*, 173. <https://doi.org/10.3390/v14020173>.
72. Takanashi, S.; Hashira, S.; Matsunaga, T.; Yoshida, A.; Shiota, T.; Tung, P.G.; Khamrin, P.; Okitsu, S.; Mizuguchi, M.; Igarashi, T.; et al. Detection, Genetic Characterization, and Quantification of Norovirus RNA from Sera of Children with Gastroenteritis. *J. Clin. Virol.* **2009**, *44*, 161–163. <https://doi.org/10.1016/j.jcv.2008.11.011>.
73. Dábilla, N.; Almeida, T.N.V.; Oliveira, A.C.R.; Kipnis, A.; Silva, T.N.; Fiaccadori, F.S.; de Sousa, T.T.; Cardoso, D.d.D.d.P.; Souza, M. Norovirus in Feces and Nasopharyngeal Swab of Children with and without Acute Gastroenteritis Symptoms: First Report of GI.5 in Brazil and GI.3 in Nasopharyngeal Swab. *J. Clin. Virol.* **2017**, *87*, 60–66. <https://doi.org/10.1016/j.jcv.2016.12.009>.
74. Anfruns-Estrada, E.; Sabrià, A.; Fuentes, C.; Sabaté, S.; Razquin, E.; Cornejo, T.; Bartolomé, R.; Torner, N.; Izquierdo, C.; Soldevila, N.; et al. Detection of Norovirus in Saliva Samples from Acute Gastroenteritis Cases and Asymptomatic Subjects: Association with Age and Higher Shedding in Stool. *Viruses* **2020**, *12*, 1369. <https://doi.org/10.3390/v12121369>.
75. Sánchez-Fauquier, A.; González-Galán, V.; Arroyo, S.; Rodà, D.; Pons, M.; García, J.-J. Norovirus-Associated Encephalitis in a Previously Healthy 2-Year-Old Girl. *J. Pediatr. Infect. Dis.* **2015**, *34*, 222–223. <https://doi.org/10.1097/INF.0000000000000547>.
76. Seitz, S.R.; Leon, J.S.; Schwab, K.J.; Lyon, G.M.; Dowd, M.; McDaniels, M.; Abdulhafid, G.; Fernandez, M.L.; Lindesmith, L.C.; Baric, R.S.; et al. Norovirus Infectivity in Humans and Persistence in Water. *Appl. Environ. Microbiol.* **2011**, *77*, 6884–6888. <https://doi.org/10.1128/AEM.05806-11>.
77. El-Heneidy, A.; Grimwood, K.M.F.; Mihala, G.M.G.; Lambert, S.; Ware, R.S. Epidemiology of Norovirus in the First 2 Years of Life in an Australian Community-Based Birth Cohort. *Pediatr. Infect. Dis. J.* **2022**, *41*, 878–884. <https://doi.org/10.1097/INF.0000000000003667>.

78. Takanashi, S.; Wang, Q.; Chen, N.; Shen, Q.; Jung, K.; Zhang, Z.; Yokoyama, M.; Lindesmith, L.C.; Baric, R.S.; Saif, L.J. Characterization of Emerging GII.4/GII.12 Noroviruses from a Gastroenteritis Outbreak in the United States in 2010. *J. Clin. Microbiol.* **2011**, *49*, 3234–3244. <https://doi.org/10.1128/JCM.00305-11>.
79. Frenck, R.; Bernstein, D.I.; Xia, M.; Huang, P.; Zhong, W.; Parker, S.; Dickey, M.; McNeal, M.; Jiang, X. Predicting Susceptibility to Norovirus GII.4 by Use of a Challenge Model Involving Humans. *J. Infect. Dis.* **2012**, *206*, 1386–1393. <https://doi.org/10.1093/infdis/jis514>.
80. Atmar, R.L.; Opekun, A.R.; Gilger, M.A.; Estes, M.K.; Crawford, S.E.; Neill, F.H.; Ramani, S.; Hill, H.; Ferreira, J.; Graham, D.Y. Determination of the 50% Human Infectious Dose for Norwalk Virus. *J. Infect. Dis.* **2014**, *209*, 1016–1022. <https://doi.org/10.1093/infdis/jit620>.
81. Gustavsson, L.; Skovbjerg, S.; Lindh, M.; Westin, J.; Andersson, L.-M. Low Serum Levels of CCL5 Are Associated with Longer Duration of Viral Shedding in Norovirus Infection. *J. Clin. Virol.* **2015**, *69*, 133–137. <https://doi.org/10.1016/j.jcv.2015.06.088>.
82. Costantini, V.P.; Cooper, E.M.; Hardaker, H.L.; Lee, L.E.; Bierhoff, M.; Biggs, C.; Cieslak, P.R.; Hall, A.J.; Vinjé, J. Epidemiologic, Virologic, and Host Genetic Factors of Norovirus Outbreaks in Long-Term Care Facilities. *Clin. Infect. Dis.* **2016**, *62*, 1–10. <https://doi.org/10.1093/cid/civ747>.
83. Roupheal, N.; Beck, A.; Kirby, A.E.; Liu, P.; Natrajan, M.S.; Lai, L.; Phadke, V.; Winston, J.; Raabe, V.; Collins, M.H.; et al. Dose-Response of a Norovirus GII.2 Controlled Human Challenge Model Inoculum. *J. Infect. Dis.* **2022**, *226*, 1771–1780. <https://doi.org/10.1093/infdis/jiac045>.
84. El-Heneidy, A.; Ware, R.S.; Lambert, S.B.; Grimwood, K. Sapovirus Infections in an Australian Community-Based Healthy Birth Cohort during the First 2 Years of Life. *Clin. Infect. Dis.* **2023**, *76*, 1043–1049. <https://doi.org/10.1093/cid/ciac861>.
85. Pascalis, H.; Temmam, S.; Turpin, M.; Rollet, O.; Flahault, A.; Carrat, F.; de Lamballerie, X.; Gérardin, P.; Dellagi, K. Intense Co-Circulation of Non-Influenza Respiratory Viruses during the First Wave of Pandemic Influenza pH1N1/2009: A Cohort Study in Reunion Island. *PLoS ONE* **2012**, *7*, e44755. <https://doi.org/10.1371/journal.pone.0044755>.
86. Kiyuka, P.K.; Agoti, C.N.; Munywoki, P.K.; Njeru, R.; Bett, A.; Otieno, J.R.; Otieno, G.P.; Kamau, E.; Clark, T.G.; Van Der Hoek, L.; et al. Human Coronavirus NL63 Molecular Epidemiology and Evolutionary Patterns in Rural Coastal Kenya. *J. Infect. Dis.* **2018**, *217*, 1728–1739. <https://doi.org/10.1093/infdis/jiy098>.
87. Grimwood, K.; Lambert, S.B.; Ware, R.S. Endemic Non-SARS-CoV-2 Human Coronaviruses in a Community-Based Australian Birth Cohort. *Pediatrics* **2020**, *146*, e2020009316. <https://doi.org/10.1542/peds.2020-009316>.
88. Lo, I.L.; Lio, C.F.; Cheong, H.H.; Lei, C.I.; Cheong, T.H.; Zhong, X.; Tian, Y.; Sin, N.N. Evaluation of SARS-CoV-2 RNA Shedding in Clinical Specimens and Clinical Characteristics of 10 Patients with COVID-19 in Macau. *Int. J. Biol. Sci.* **2020**, *16*, 1698–1707. <https://doi.org/10.7150/ijbs.45357>.
89. A De Ioris, M.; Scarselli, A.; degli Atti, M.L.C.; Ravà, L.; Smarrazzo, A.; Concato, C.; Romani, L.; Scrocca, R.; Geremia, C.; Carletti, M.; et al. Dynamic Viral Severe Acute Respiratory Syndrome Coronavirus 2 RNA Shedding in Children: Preliminary Data and Clinical Consideration from a Italian Regional Center. *J. Pediatr. Infect. Dis. Soc.* **2020**, *9*, 366–369. <https://doi.org/10.1093/jpids/piaa065>.
90. Chen, Y.; Chen, L.; Deng, Q.; Zhang, G.; Wu, K.; Ni, L.; Yang, Y.; Liu, B.; Wang, W.; Wei, C.; et al. The Presence of SARS-CoV-2 RNA in the Feces of COVID-19 Patients. *J. Med. Virol.* **2020**, *92*, 833–840. <https://doi.org/10.1002/jmv.25825>.
91. Huang, J.-T.; Ran, R.-X.; Lv, Z.-H.; Feng, L.-N.; Ran, C.-Y.; Tong, Y.-Q.; Li, D.; Su, H.-W.; Zhu, C.-L.; Qiu, S.-L.; et al. Chronological Changes of Viral Shedding in Adult Inpatients with COVID-19 in Wuhan, China. *Clin. Infect. Dis.* **2020**, *71*, 2158–2166. <https://doi.org/10.1093/cid/ciaa631>.
92. Liu, M.; Huang, H.; Bian, X.; Zheng, Z.; Li, N.; Sun, B.; Wu, J.-L. A Prospective Cohort Study of the Presence of SARS-CoV-2 in Clinical Samples from Multiple Bodily Sites: Implications for Transmission Routes of COVID-19. *J. Bio-X Res.* **2022**, *5*, 27–34. <https://doi.org/10.1097/JBR.0000000000000114>.
93. Mumm, J.-N.; Ledderose, S.; Ostermann, A.; Rudelius, M.; Hellmuth, J.C.; Münchhoff, M.; Munker, D.; Scherer, C.; Volz, Y.; Ebner, B.; et al. Dynamics of Urinary and Respiratory Shedding of Severe Acute Respiratory Syndrome Virus 2 (SARS-CoV-2) RNA Excludes Urine as a Relevant Source of Viral Transmission. *Infection* **2022**, *50*, 635–642. <https://doi.org/10.1007/s15010-021-01724-4>.
94. Chen, L.; Olson, L.B.; Naqvi, I.A.; Sullenger, B.A.; Que, L.G.; Denny, T.N.; Kraft, B.D. SARS-CoV-2 Viremia but Not Respiratory Viral Load Is Associated with Respiratory Complications in Patients with Severe COVID-19. *BMC Pulm. Med.* **2024**, *24*, 366. <https://doi.org/10.1186/s12890-024-03183-7>.

95. Alidjinou, E.K.; Poissy, J.; Ouafi, M.; Caplan, M.; Benhalima, I.; Goutay, J.; Tinez, C.; Faure, K.; Chopin, M.-C.; Yelnik, C.; et al. Spatial and Temporal Virus Load Dynamics of Sars-Cov-2: A Single-Center Cohort Study. *Diagnostics* **2021**, *11*, 427. <https://doi.org/10.3390/diagnostics11030427>.
96. Chen, G.-Q.; Luo, W.-T.; Zhao, C.-H.; Li, C.-N.; Hong, Z.-S.; Xia, J.-Y.; Liu, X. Comparison of Clinical Characteristics between Fecal/Perianal Swab Nucleic Acid-Positive and -Negative Patients with COVID-19. *J. Infect. Dev. Ctries.* **2020**, *14*, 847–852. <https://doi.org/10.3855/jidc.12885>.
97. Eberhardt, K.A.; Meyer-Schwickerath, C.; Heger, E.; Knops, E.; Lehmann, C.; Rybníček, J.; Schommers, P.; Eichenauer, D.A.; Kurth, F.; Ramharter, M.; et al. RNAemia Corresponds to Disease Severity and Antibody Response in Hospitalized COVID-19 Patients. *Viruses* **2020**, *12*, 1045. <https://doi.org/10.3390/v12091045>.
98. Li, H.; Ren, L.; Zhang, L.; Wang, Y.; Guo, L.; Wang, C.; Xiao, Y.; Rao, J.; Wang, X.; Liu, Y.; et al. High Anal Swab Viral Load Predisposes Adverse Clinical Outcomes in Severe COVID-19 Patients. *Emerg. Microbes Infect.* **2020**, *9*, 2707–2714. <https://doi.org/10.1080/22221751.2020.1858700>.
99. Signorini, L.; Dolci, M.; Castelnovo, N.; Crespi, L.; Incorvaia, B.; Bagnoli, P.; Parapini, S.; Basilico, N.; Galli, C.; Ambrogi, F.; et al. Longitudinal, Virological, and Serological Assessment of Hospitalized COVID-19 Patients. *J. NeuroVirology* **2022**, *28*, 113–122. <https://doi.org/10.1007/s13365-021-01029-0>.
100. Ynga-Durand, M.; Maaß, H.; Milošević, M.; Krstanić, F.; Matešić, M.P.; Jonjić, S.; Protić, A.; Brizić, I.; Štitić, A.; Čičin-šain, L. SARS-CoV-2 Viral Load in the Pulmonary Compartment of Critically Ill COVID-19 Patients Correlates with Viral Serum Load and Fatal Outcomes. *Viruses* **2022**, *14*, 1292. <https://doi.org/10.3390/v14061292>.
101. Yuan, C.; Zhu, H.; Yang, Y.; Cai, X.; Xiang, F.; Wu, H.; Yao, C.; Xiang, Y.; Xiao, H. Viral Loads in Throat and Anal Swabs in Children Infected with SARS-CoV-2. *Emerg. Microbes Infect.* **2020**, *9*, 1233–1237. <https://doi.org/10.1080/22221751.2020.1771219>.
102. Zhang, J.; Li, K.; Zheng, L.; Ren, Z.; Song, T.; Yu, H.; Yang, Z.; Wang, L.; Jiang, L. Improving Detection Efficiency of SARS-CoV-2 Nucleic Acid Testing. *Front. Cell. Infect. Microbiol.* **2020**, *10*, 558472. <https://doi.org/10.3389/fcimb.2020.558472>.
103. Zingaropoli, M.A.; Iannetta, M.; Piermatteo, L.; Pasculli, P.; Latronico, T.; Mazzuti, L.; Campogiani, L.; Duca, L.; Ferraguti, G.; De Michele, M.; et al. Neuro-Axonal Damage and Alteration of Blood–Brain Barrier Integrity in COVID-19 Patients. *Cells* **2022**, *11*, 2480. <https://doi.org/10.3390/cells11162480>.
104. Eijk, L.E.V.; Ertugrul, I.A.; Upasani, V.; Wold, K.I.; Vincenti-Gonzalez, M.F.; Veloo, A.C.M.; Bourgonje, A.R.; Pantano, D.; Gard, L.; de Boer, G.; et al. Temporal Dynamics and (Para)Clinical Factors Associated With (Long) Viral RNA Shedding in COVID-19 Nonhospitalized Individuals—The COVID-HOME Study. *J. Med. Virol.* **2024**, *96*, e70125. <https://doi.org/10.1002/jmv.70125>.
105. Cairns, D.M.; Dulko, D.; Griffiths, J.K.; Golan, Y.; Cohen, T.; Trinquart, L.; Price, L.L.; Beaulac, K.R.; Selker, H.P. Efficacy of Niclosamide vs. Placebo in SARS-CoV-2 Respiratory Viral Clearance, Viral Shedding, and Duration of Symptoms among Patients with Mild to Moderate COVID-19: A Phase 2 Randomized Clinical Trial. *JAMA Netw. Open* **2022**, *5*, e2144942. <https://doi.org/10.1001/jamanetworkopen.2021.44942>.
106. Díaz, L.A.; García-Salum, T.; Fuentes-López, E.; Reyes, D.; Ortiz, J.; Chahuan, J.; Levican, J.; Almonacid, L.I.; Valenzuela, G.H.; Serrano, E.; et al. High Prevalence of SARS-CoV-2 Detection and Prolonged Viral Shedding in Stools: A Systematic Review and Cohort Study. *Gastroenterol. Hepatol.* **2022**, *45*, 593–604. <https://doi.org/10.1016/j.gastrohep.2021.12.009>.
107. Han, W.G.H.; Swart, A.; Marinović, A.B.; Eggink, D.; Reimerink, J.; Wijsman, L.A.; van der Veer, B.; Brink, S.v.D.; Brandt, A.-M.v.D.; van Tol, S.; et al. SARS-CoV-2 RNA and Antibody Dynamics in a Dutch Household Study with Dense Sampling Frame. *Sci. Rep.* **2022**, *12*, 7937. <https://doi.org/10.1038/s41598-022-11480-6>.
108. Holm-Jacobsen, J.N.; Bundgaard-Nielsen, C.; Rold, L.S.; Jensen, A.-M.; Shakar, S.; Ludwig, M.; Kirk, K.F.; Donneborg, M.L.; Vonasek, J.H.; Pedersen, B.; et al. The Prevalence and Clinical Implications of Rectal SARS-CoV-2 Shedding in Danish COVID-19 Patients and the General Population. *Front. Med.* **2021**, *8*, 804804. <https://doi.org/10.3389/fmed.2021.804804>.
109. Jung, S.H.; Kim, S.W.; Lee, H.; Oh, J.H.; Lim, J. Serial Screening for SARS-CoV-2 in Rectal Swabs of Symptomatic COVID-19 Patients. *J. Korean Med. Sci.* **2021**, *36*, e301. <https://doi.org/10.3346/jkms.2021.36.e301>.
110. Khemiri, H.; Gdoura, M.; Ben Halima, S.; Krichen, H.; Cammà, C.; Lorusso, A.; Ancora, M.; Di Pasquale, A.; Cherni, A.; Touzi, H.; et al. SARS-CoV-2 Excretion Kinetics in Nasopharyngeal and Stool Samples from the Pediatric Population. *Front. Med.* **2023**, *10*, 1226207. <https://doi.org/10.3389/fmed.2023.1226207>.
111. Lin, W.; Xie, Z.; Li, Y.; Li, L.; Wen, C.; Cao, Y.; Chen, X.; Ou, X.; Hu, F.; Li, F.; et al. Association between Detectable SARS-COV-2 RNA in Anal Swabs and Disease Severity in Patients with Coronavirus Disease 2019. *J. Med. Virol.* **2021**, *93*, 794–802. <https://doi.org/10.1002/jmv.26307>.

112. Li, X.; Fang, C.; Yang, H.; Chen, M.; She, L.; Gong, Y.; Zeng, F.; Ye, J.; Tan, L.; Zhong, Q.; et al. Analysis of Viral Nucleic Acid and Cytokines in 12 Children with 2019-nCoV Infection. *Chin. J. Microbiol. Immunol.* **2020**, *40*, 574–578. <https://doi.org/10.3760/cma.j.cn112309-20200602-00286>.
113. Park, S.-K.; Lee, C.-W.; Park, D.-I.; Woo, H.-Y.; Cheong, H.S.; Shin, H.C.; Ahn, K.; Kwon, M.-J.; Joo, E.-J. Detection of SARS-CoV-2 in Fecal Samples From Patients With Asymptomatic and Mild COVID-19 in Korea. *Clin. Gastroenterol. Hepatol.* **2021**, *19*, 1387–1394.e2. <https://doi.org/10.1016/j.cgh.2020.06.005>.
114. Qiu, C.; Song, Z.; Wang, J.; Tian, C.; Liu, X.; Wu, T.; Li, W.; Zhang, S.; Lu, H. Saliva Specimen Complements Anal Swab in Assessing Patients with COVID-19 for Discharge from Hospital. *Emerg. Microbes Infect.* **2021**, *10*, 2090–2097. <https://doi.org/10.1080/22221751.2021.1997339>.
115. Gonzalez, J.R.; Cardozo, D.P.; Corchuelo, S.; Zabaleta, G.; Alarcón, Z.; Sepulveda, M.T.H.; Donato, K.L.; Muñoz, C.F.; Diaz, D.A.A.; Perez, Y.G.T.; et al. Prolonged SARS-CoV-2 Nucleic Acid Conversion Time in Military Personnel Outbreaks with Presence of Specific IgG Antibodies. *J. Med. Microbiol.* **2022**, *71*, 001498. <https://doi.org/10.1099/jmm.0.001498>.
116. Shi, D.; Wu, W.; Wang, Q.; Xu, K.; Xie, J.; Wu, J.; Lv, L.; Sheng, J.; Guo, J.; Wang, K.; et al. Clinical Characteristics and Factors Associated with Long-Term Viral Excretion in Patients with Severe Acute Respiratory Syndrome Coronavirus 2 Infection: A Single-Center 28-Day Study. *J. Infect. Dis.* **2020**, *222*, 910–918. <https://doi.org/10.1093/infdis/jiaa388>.
117. Wang, Q.-J.; Yao, Y.-Z.; Song, J.-S.; Wang, Q.; Xu, L.-Y.; Bao, Z.-J.; Mao, D.-W.; Zhou, J.-H.; Zhang, Z.-E.; Wang, Y.; et al. Kinetic Changes in Virology, Specific Antibody Response and Imaging during the Clinical Course of COVID-19: A Descriptive Study. *BMC Infect. Dis.* **2020**, *20*, 818. <https://doi.org/10.1186/s12879-020-05549-8>.
118. Wang, Q.-X.; Huang, K.-C.; Qi, L.; Zeng, X.-H.; Zheng, S.-L. No Infectious Risk of COVID-19 Patients with Long-Term Fecal 2019-nCoV Nucleic Acid Positive. *Eur. Rev. Med. Pharmacol. Sci.* **2020**, *24*, 5772–5777. [https://doi.org/10.26355/eurev\\_202005\\_21370](https://doi.org/10.26355/eurev_202005_21370).
119. Wu, W.; Shi, D.; Zhu, X.; Xie, J.; Xu, X.; Chen, Y.; Wu, J.; Li, L. Characteristics of COVID-19 Patients With SARS-CoV-2 Positivity in Feces. *Front. Cell. Infect. Microbiol.* **2022**, *12*, 853212. <https://doi.org/10.3389/fcimb.2022.853212>.
120. Xu, Y.; Li, X.; Zhu, B.; Liang, H.; Fang, C.; Gong, Y.; Guo, Q.; Sun, X.; Zhao, D.; Shen, J.; et al. Characteristics of Pediatric SARS-CoV-2 Infection and Potential Evidence for Persistent Fecal Viral Shedding. *Nat. Med.* **2020**, *26*, 502–505. <https://doi.org/10.1038/s41591-020-0817-4>.
121. Zhang, C.; Mu, J.; Zhang, D.; Li, J.; Wang, H.; Jin, Y.; Han, Y.; Li, H.; Yu, P.; Guo, R.; et al. Diverse Clinical Processes of 16 COVID-19 Cases Who Concentrated Infection in the Same Workplace in Beijing, China: An Observational Study. *Medicine* **2020**, *99*, e23800. <https://doi.org/10.1097/MD.00000000000023800>.
122. Wang, X.; Zheng, J.; Guo, L.; Yao, H.; Wang, L.; Xia, X.; Zhang, W. Fecal Viral Shedding in COVID-19 Patients: Clinical Significance, Viral Load Dynamics and Survival Analysis. *Virus Res.* **2020**, *289*, 198147. <https://doi.org/10.1016/j.virusres.2020.198147>.
123. Zhang, S.; Zhu, H.; Ye, H.; Hu, Y.; Zheng, N.; Huang, Z.; Xiong, Z.; Fu, L.; Cai, T. Risk Factors for Prolonged Virus Shedding of Respiratory Tract and Fecal in Adults with Severe Acute Respiratory Syndrome Coronavirus-2 Infection. *J. Clin. Lab. Anal.* **2021**, *35*, e23923. <https://doi.org/10.1002/jcla.23923>.
124. Liu, H.; Wei, P.; Kappler, J.W.; Marrack, P.; Zhang, G. SARS-CoV-2 Variants of Concern and Variants of Interest Receptor Binding Domain Mutations and Virus Infectivity. *Front. Immunol.* **2022**, *13*, 825256. <https://doi.org/10.3389/fimmu.2022.825256>.
125. Ribeiro, I.P.; Nascimento, L.G.D.; Tort, L.F.L.; Pereira, E.C.; Menezes, L.S.R.; Malta, F.C.; de Oliveira, B.C.E.P.D.; Rodrigues, J.P.; Manso, P.P.d.A.; Pelajo, M.; et al. Infectious SARS-CoV-2 Particles from Rectal Swab Samples from COVID-19 Patients in Brazil. *Viruses* **2023**, *15*, 1152. <https://doi.org/10.3390/v15051152>.
126. Southern, T.R.; Racska, L.D.; Albarrino, C.G.; Fey, P.D.; Hinrichs, S.H.; Murphy, C.N.; Herrera, V.L.; Sambol, A.R.; Hill, C.E.; Ryan, E.L.; et al. Comparison of FilmArray and Quantitative Real-Time Reverse Transcriptase PCR for Detection of Zaire Ebolavirus from Contrived and Clinical Specimens. *J. Clin. Microbiol.* **2015**, *53*, 2956–2960. <https://doi.org/10.1128/JCM.01317-15>.
127. Gay-Andrieu, F.; Magassouba, N.; Picot, V.; Phillips, C.L.; Peyrefitte, C.N.; Dacosta, B.; Doré, A.; Kourouma, F.; Ligeon-Ligeonnet, V.; Gauby, C.; et al. Clinical Evaluation of the BioFire FilmArray® BioThreat-E Test for the Diagnosis of Ebola Virus Disease in Guinea. *J. Clin. Virol.* **2017**, *92*, 20–24. <https://doi.org/10.1016/j.jcv.2017.04.015>.
128. Lanini, S.; Portella, G.; Vairo, F.; Kobinger, G.P.; Pesenti, A.; Langer, M.; Kabia, S.; Brogiato, G.; Amone, J.; Castilletti, C.; et al. Blood Kinetics of Ebola Virus in Survivors and Nonsurvivors. *J. Clin. Investig.* **2015**, *125*, 4692–4698. <https://doi.org/10.1172/JCI83111>.
129. Sagui, E.; Janvier, F.; Baize, S.; Foissaud, V.; Koulibaly, F.; Savini, H.; Maugey, N.; Aletti, M.; Granier, H.; Carmoi, T. Severe Ebola Virus Infection With Encephalopathy: Evidence for Direct Virus Involvement. *Clin. Infect. Dis.* **2015**, *61*, 1627–1628. <https://doi.org/10.1093/cid/civ606>.

130. Towner, J.S.; Rollin, P.E.; Bausch, D.G.; Sanchez, A.; Crary, S.M.; Vincent, M.; Lee, W.F.; Spiropoulou, C.F.; Ksiazek, T.G.; Lukwiya, M.; et al. Rapid Diagnosis of Ebola Hemorrhagic Fever by Reverse Transcription-PCR in an Outbreak Setting and Assessment of Patient Viral Load as a Predictor of Outcome. *J. Virol.* **2004**, *78*, 4330–4341. <https://doi.org/10.1128/jvi.78.8.4330-4341.2004>.
131. Weller, S.A.; Bailey, D.; Matthews, S.; Lumley, S.; Sweed, A.; Ready, D.; Eltringham, G.; Richards, J.; Vipond, R.; Lukaszewski, R.; et al. Evaluation of the Biofire FilmArray BioThreat-E Test (v2.5) for Rapid Identification of Ebola Virus Disease in Heat-Treated Blood Samples Obtained in Sierra Leone and the United Kingdom. *J. Clin. Microbiol.* **2016**, *54*, 114–119. <https://doi.org/10.1128/JCM.02287-15>.
132. Formenty, P.; Leroy, E.M.; Epelboin, A.; Libama, F.; Lenzi, M.; Sudeck, H.; Yaba, P.; Allaranger, Y.; Boumandlouki, P.; Nkounkou, V.B.; et al. Detection of Ebola Virus in Oral Fluid Specimens during Outbreaks of Ebola Virus Hemorrhagic Fever in the Republic of Congo. *Clin. Infect. Dis.* **2006**, *42*, 1521–1526. <https://doi.org/10.1086/503836>.
133. Ji, Y.-J.; Duan, X.-Z.; Gao, X.-D.; Li, L.; Li, C.; Ji, D.; Li, W.-G.; Wang, L.-F.; Meng, Y.-H.; Yang, X.; et al. Clinical Presentations and Outcomes of Patients with Ebola Virus Disease in Freetown, Sierra Leone. *Infect. Dis. Poverty* **2016**, *5*, 61–70. <https://doi.org/10.1186/s40249-016-0195-9>.
134. Kjalldgaard, L.; Claude, K.M.; Mukadi-Bamuleka, D.; Kitenge-Omasumbu, R.; Dixit, D.; Edidi-Atani, F.; Kuamfumu, M.M.; Bulabula-Penge, J.; Mambu-Mbika, F.; Tshiani-Mbaya, O.; et al. Virus Kinetics and Biochemical Derangements among Children with Ebolavirus Disease. *eClinicalMedicine* **2022**, *53*, 101638. <https://doi.org/10.1016/j.eclinm.2022.101638>.
135. Humaidi, M.; Tien, W.P.; Yap, G.; Chua, C.R.; Ng, L.C. Non-Invasive Dengue Diagnostics—The Use of Saliva and Urine for Different Stages of the Illness. *Diagnostics* **2021**, *11*, 1345. <https://doi.org/10.3390/diagnostics11081345>.
136. Zvereva, N.N.; Karan, L.S.; Sayfullin, R.F.; Grigoreva, Y.E.; Morozkin, E.S.; Pshenichnaya, N.Y.; Smetanina, S.V.; Sayfullin, M.A. Detection of Dengue Virus RNA in Various Biological Fluids in Acute and Convalescent Phases. *Infect. Dis. News Opin. Train.* **2023**, *12*, 42–48. <https://doi.org/10.33029/2305-3496-2023-12-2-42-48>.
137. Du, C.; Zeng, H.; Li, X.; Wu, C.; Huang, Y.; Yang, F.; Guo, C.; Xu, L.; Li, L.; Liang, Z.; et al. Assessing Wastewater Detection Limit for Dengue Virus via Urinary and Fecal Shedding Modeling. *Water Res. X* **2026**, *31*, 100548. <https://doi.org/10.1016/j.wroa.2026.100548>.
138. Hirayama, T.; Mizuno, Y.; Takeshita, N.; Kotaki, A.; Tajima, S.; Omatsu, T.; Sano, K.; Kurane, I.; Takasaki, T. Detection of Dengue Virus Genome in Urine by Real-Time Reverse Transcriptase PCR: A Laboratory Diagnostic Method Useful after Disappearance of the Genome in Serum. *J. Clin. Microbiol.* **2012**, *50*, 2047–2052. <https://doi.org/10.1128/JCM.06557-11>.
139. Korhonen, E.M.; Huhtamo, E.; Virtala, A.-M.K.; Kantele, A.; Vapalahti, O. Approach to Non-Invasive Sampling in Dengue Diagnostics: Exploring Virus and NS1 Antigen Detection in Saliva and Urine of Travelers with Dengue. *J. Clin. Virol.* **2014**, *61*, 353–358. <https://doi.org/10.1016/j.jcv.2014.08.021>.
140. Van den Bossche, D.; Cnops, L.; Van Esbroeck, M. Recovery of Dengue Virus from Urine Samples by Real-Time RT-PCR. *Eur. J. Clin. Microbiol. Infect. Dis.* **2015**, *34*, 1361–1367. <https://doi.org/10.1007/s10096-015-2359-0>.
141. Barzon, L.; Gobbi, F.; Capelli, G.; Montarsi, F.; Martini, S.; Riccetti, S.; Sinigaglia, A.; Pacenti, M.; Pavan, G.; Rattu, M.; et al. Autochthonous Dengue Outbreak in Italy 2020: Clinical, Virological and Entomological Findings. *J. Travel Med.* **2021**, *28*, taab130. <https://doi.org/10.1093/jtm/taab130>.
142. Vita, S.; Lalle, E.; Caputi, P.; Faraglia, F.; D'ABramo, A.; Bordi, L.; De Carli, G.; Sberna, G.; Giancola, M.L.; Maffongelli, G.; et al. Dengue Fever as Autochthonous Infectious Disease in Italy: Epidemiological, Clinical and Virological Characteristics. *Travel Med. Infect. Dis.* **2024**, *62*, 102762. <https://doi.org/10.1016/j.tmaid.2024.102762>.
143. Stauber, C.; Jacob-Nascimento, L.C.; Grosch, C.; Sousa, M.d.S.; Portilho, M.M.; Anjos, R.O.; Brinton, M.A.; Kitron, U.; Reis, M.G.; Ribeiro, G.S. Presence of Dengue Virus RNA in Urine and Oral Fluid of Laboratory-Confirmed Dengue Patients: Implications for Wastewater Surveillance. *Braz. J. Infect. Dis.* **2025**, *29*, 104484. <https://doi.org/10.1016/j.bjid.2024.104484>.
144. Matusali, G.; Manica, M.; D'ABramo, A.; Carletti, F.; Maffongelli, G.; Colavita, F.; Poletti, P.; Lalle, E.; Sberna, G.; Specchiarello, E.; et al. Dengue Virus Dynamic and Persistence in Body Fluids of Infected Patients in Italy, 2018–2023. *J. Med. Virol.* **2025**, *97*, e70322. <https://doi.org/10.1002/jmv.70322>.
145. Andries, A.-C.; Duong, V.; Ly, S.; Cappelle, J.; Kim, K.S.; Try, P.L.; Ros, S.; Ong, S.; Huy, R.; Horwood, P.; et al. Value of Routine Dengue Diagnostic Tests in Urine and Saliva Specimens. *PLoS Negl. Trop. Dis.* **2015**, *9*, e0004100. <https://doi.org/10.1371/journal.pntd.0004100>.
146. Mello, C.D.S.; Cabral-Castro, M.J.; Silva De Faria, L.C.; Peralta, J.M.; Puccioni-Sohler, M. Dengue and Chikungunya Infection in Neurologic Disorders from Endemic Areas in Brazil. *Neurol. Clin. Pract.* **2020**, *10*, 497–502. <https://doi.org/10.1212/CPJ.0000000000000776>.

147. Solomon, T.; Dung, N.M.; Vaughn, D.W.; Kneen, R.; Thao, L.T.T.; Raengsakulrach, B.; Loan, H.T.; Day, N.P.; Farrar, J.; Myint, K.S.; et al. Neurological Manifestations of Dengue Infection. *Lancet* **2000**, *355*, 1053–1059. [https://doi.org/10.1016/S0140-6736\(00\)02036-5](https://doi.org/10.1016/S0140-6736(00)02036-5).
148. Tun, M.M.N.; Muthugala, R.; Nabeshima, T.; Soe, A.M.; Dumre, S.P.; Rajamanthri, L.; Jayawardana, D.; Attanayake, S.; Inoue, S.; Morita, K. Complete Genome Analysis and Characterization of Neurotropic Dengue Virus 2 Cosmopolitan Genotype Isolated from the Cerebrospinal Fluid of Encephalitis Patients. *PLoS ONE* **2020**, *15*, e0234508. <https://doi.org/10.1371/journal.pone.0234508>.
149. Mishra, V.K.; Khan, T.; Jeet, A.; Prakash, O.; Chandrakanta; Srivastava, A.K.; Singh, S.; Pathak, N.; Jain, A. Etiology of Meningoencephalitis in Children Aged Less than 5 Years. *Indian J. Pathol. Microbiol.* **2024**, *67*, 576–580. [https://doi.org/10.4103/ijpm.ijpm\\_60\\_23](https://doi.org/10.4103/ijpm.ijpm_60_23).
150. Quarsten, H.; Andreassen, Å.K.; Paulsen, K.M.; Diekmann, M.J.; Eikeland, R.; Hellenen, R.; Bergström, T.; Noraas, S.; Lorentzen, Å.R. No Detection of Tick-Borne Encephalitis Virus RNA in Blood, Urine or Saliva of Hospitalised Immunocompetent Tick-Borne Encephalitis Patients. *PLoS ONE* **2024**, *19*, e0305603. <https://doi.org/10.1371/journal.pone.0305603>.
151. Puchhammer-Stockl, E.; Kunz, C.; Mandl, C.W.; Heinz, F.X. Identification of Tick-Borne Encephalitis Virus Ribonucleic Acid in Tick Suspensions and in Clinical Specimens by a Reverse Transcription-Nested Polymerase Chain Reaction Assay. *Clin. Diagn. Virol.* **1995**, *4*, 321–326. [https://doi.org/10.1016/0928-0197\(95\)00022-4](https://doi.org/10.1016/0928-0197(95)00022-4).
152. Saksida, A.; Duh, D.; Lotrič-Furlan, S.; Strle, F.; Petrovec, M.; Avšič-Županc, T. The Importance of Tick-Borne Encephalitis Virus RNA Detection for Early Differential Diagnosis of Tick-Borne Encephalitis. *J. Clin. Virol.* **2005**, *33*, 331–335. <https://doi.org/10.1016/j.jcv.2004.07.014>.
153. Grygorczuk, S.; Dunaj-Małyszko, J.; Czupryna, P.; Sulik, A.; Toczyłowski, K.; Siemieniako-Werszko, A.; Żebrowska, A.; Pancewicz, S.; Moniuszko-Malinowska, A. The Detectability of the Viral RNA in Blood and Cerebrospinal Fluid of Patients with Tick-Borne Encephalitis. *Int. J. Mol. Sci.* **2022**, *23*, 9332. <https://doi.org/10.3390/ijms23169332>.
154. Yoon, D.; Shin, S.H.; Jang, H.-C.; Kim, E.S.; Song, E.H.; Moon, S.M.; Shin, S.Y.; Choe, P.G.; Sung, J.-J.; Choi, E.H.; et al. Epidemiology and Clinical Characteristics of Zika Virus Infections Imported into Korea from March to October 2016. *J. Korean Med. Sci.* **2017**, *32*, 1440–1444. <https://doi.org/10.3346/jkms.2017.32.9.1440>.
155. Burger-Calderon, R.; Gonzalez, K.; Ojeda, S.; Zambrana, J.V.; Sanchez, N.; Cruz, C.C.; Laguna, H.S.; Bustos, F.; Plazaola, M.; Mercado, B.L.; et al. Zika Virus Infection in Nicaraguan Households. *PLoS Negl. Trop. Dis.* **2018**, *12*, e0006518. <https://doi.org/10.1371/journal.pntd.0006518>.
156. George, K.S.; Sohi, I.S.; Dufort, E.M.; Dean, A.B.; White, J.L.; Limberger, R.; Sommer, J.N.; Ostrowski, S.; Wong, S.J.; Backenson, P.B.; et al. Zika Virus Testing Considerations: Lessons Learned from the First 80 Real-Time Reverse Transcription-PCR-Positive Cases Diagnosed in New York State. *J. Clin. Microbiol.* **2017**, *55*, 535–544. <https://doi.org/10.1128/JCM.01232-16>.
157. Jeong, Y.E.; Cha, G.-W.; Cho, J.E.; Lee, E.J.; Jee, Y.; Lee, W.-J. Viral and Serological Kinetics in Zika Virus-Infected Patients in South Korea. *Virol. J.* **2017**, *14*, 70. <https://doi.org/10.1186/s12985-017-0740-6>.
158. Rossini, G.; Gaibani, P.; Vocale, C.; Cagarelli, R.; Landini, M.P. Comparison of Zika Virus (ZIKV) RNA Detection in Plasma, Whole Blood and Urine—Case Series of Travel-Associated ZIKV Infection Imported to Italy, 2016. *J. Infect.* **2017**, *75*, 242–245. <https://doi.org/10.1016/j.jinf.2017.05.021>.
159. Jogueux, G.; Mansuy, J.-M.; Matusali, G.; Hamdi, S.; Walschaerts, M.; Pavili, L.; Guyomard, S.; Prisant, N.; Lamarre, P.; Dejucq-Rainsford, N.; et al. Effect of Acute Zika Virus Infection on Sperm and Virus Clearance in Body Fluids: A Prospective Observational Study. *Lancet Infect. Dis.* **2017**, *17*, 1200–1208. [https://doi.org/10.1016/S1473-3099\(17\)30444-9](https://doi.org/10.1016/S1473-3099(17)30444-9).
160. Jia, H.; Zhang, M.; Chen, M.; Yang, Z.; Li, J.; Huang, G.; Guan, D.; Cen, X.; Zhang, L.; Feng, Q.; et al. Zika Virus Infection in Travelers Returning from Countries with Local Transmission, Guangdong, China, 2016. *Travel Med. Infect. Dis.* **2018**, *21*, 56–61. <https://doi.org/10.1016/j.tmaid.2017.11.012>.
161. Barzon, L.; Percivalle, E.; Pacenti, M.; Rovida, F.; Zavattoni, M.; Del Bravo, P.; Cattelan, A.M.; Palù, G.; Baldanti, F. Virus and Antibody Dynamics in Travelers with Acute Zika Virus Infection. *Clin. Infect. Dis.* **2018**, *66*, 1173–1180. <https://doi.org/10.1093/cid/cix967>.
162. Paz-Bailey, G.; Rosenberg, E.S.; Doyle, K.; Munoz-Jordan, J.; Santiago, G.A.; Klein, L.; Perez-Padilla, J.; Medina, F.A.; Waterman, S.H.; Adams, L.E.; et al. Persistence of Zika Virus in Body Fluids-Final Report. *N. Engl. J. Med.* **2018**, *379*, 1234–1243. <https://doi.org/10.1056/NEJMoa1613108>.
163. Tozetto-Mendoza, T.R.; Avelino-Silva, V.I.; Fonseca, S.; Claro, I.M.; de Paula, A.V.; Levin, A.S.; Sabino, E.C.; Mendes-Correa, M.C.; Figueiredo, W.M.; Felix, A.C.; et al. Zika Virus Infection among Symptomatic Patients from Two Healthcare Centers in

- Sao Paulo State, Brazil: Prevalence, Clinical Characteristics, Viral Detection in Body Fluids and Serodynamics. *Rev. do Inst. de Med. Trop. de Sao Paulo* **2019**, *61*, e19. <https://doi.org/10.1590/s1678-9946201961019>.
164. Stone, M.; Bakkour, S.; Lanteri, M.C.; Brambilla, D.; Simmons, G.; Bruhn, R.; Kaidarova, Z.; Lee, T.-H.; Orlando Alsina, J.; Williamson, P.C.; et al. Zika Virus RNA and IgM Persistence in Blood Compartments and Body Fluids: A Prospective Observational Study. *Lancet Infect. Dis.* **2020**, *20*, 1446–1456. [https://doi.org/10.1016/S1473-3099\(19\)30708-X](https://doi.org/10.1016/S1473-3099(19)30708-X).
  165. Lustig, Y.; Koren, R.; Biber, A.; Zuckerman, N.; Mendelson, E.; Schwartz, E. Screening and Exclusion of Zika Virus Infection in Travellers by an NS1-Based ELISA and qRT-PCR. *Clin. Microbiol. Infect.* **2020**, *26*, 1687.e7–1687.e11. <https://doi.org/10.1016/j.cmi.2020.02.037>.
  166. Da Silva, I.R.F.; Frontera, J.A.; De Filippis, A.M.B.; Do Nascimento, O.J.M. Neurologic Complications Associated with the Zika Virus in Brazilian Adults. *JAMA Neurol.* **2017**, *74*, 1190–1198. <https://doi.org/10.1001/jamaneurol.2017.1703>.
  167. Ferrés, M.; Martínez-Valdebenito, C.; Henriquez, C.; Marco, C.; Angulo, J.; Barrera, A.; Palma, C.; Barriga Pinto, G.; Cuiza, A.; Ferreira, L.; et al. Viral Shedding and Viraemia of Andes Virus during Acute Hantavirus Infection: A Prospective Study. *Lancet Infect. Dis.* **2024**, *24*, 775–782. [https://doi.org/10.1016/S1473-3099\(24\)00142-7](https://doi.org/10.1016/S1473-3099(24)00142-7).
  168. Reynes, J.-M.; Schaeffer, L.; Papadopoulos, P.; Ait-Ahmed, M.; Siby-Diakite, D.; Ripaux-Lefèvre, M.; Buivan, T.-P.; Lechat, S.; Vray, M.; Galempoix, J.-M.; et al. Molecular Detection of Orthohantavirus Puumalaense in Plasma and Urine Samples from Hospitalized Patients Presenting with a Serologically Confirmed Acute Hantavirus Infection in France. *J. Clin. Microbiol.* **2023**, *61*, e0037223. <https://doi.org/10.1128/jcm.00372-23>.
  169. Pettersson, L.; Rasmuson, J.; Andersson, C.; Ahlm, C.; Evander, M. Hantavirus-Specific IgA in Saliva and Viral Antigen in the Parotid Gland in Patients with Hemorrhagic Fever with Renal Syndrome. *J. Med. Virol.* **2011**, *83*, 864–870. <https://doi.org/10.1002/jmv.22040>.
  170. Shafique, M.; Ahmad, N.; Awan, F.R.; Mustafa, T.; Ullah, M.; Qureshi, J.A. Investigating the Concurrent Presence of HCV in Serum, Oral Fluid and Urine Samples from Chronic HCV Patients in Faisalabad, Pakistan. *Arch. Virol.* **2009**, *154*, 1523–1527. <https://doi.org/10.1007/s00705-009-0477-7>.
  171. Liou, T.; Chang, T.; Young, K.; Lin, X.; Lin, C.; Wu, H. Detection of HCV RNA in Saliva, Urine, Seminal Fluid, and Ascites. *J. Med. Virol.* **1992**, *37*, 197–202. <https://doi.org/10.1002/jmv.1890370309>.
  172. Numata, N.; Ohori, H.; Hayakawa, Y.; Saitoh, Y.; Tsunoda, A.; Kanno, A. Demonstration of Hepatitis C Virus Genome in Saliva and Urine of Patients with Type C Hepatitis: Usefulness of the Single Round Polymerase Chain Reaction Method for Detection of the HCV Genome. *J. Med. Virol.* **1993**, *41*, 120–128. <https://doi.org/10.1002/jmv.1890410207>.
  173. Caldwell, S.H.; Sue, M.; Bowden, J.H.; Dickson, R.C.; Driscoll, C.J.; Yeaton, P.; Stevenson, W.C.; Ishitani, M.B.; McCullough, C.S.; Pruett, T.L.; et al. Hepatitis C Virus in Body Fluids after Liver Transplantation. *Liver Transplant. Surg.* **1996**, *2*, 124–129. <https://doi.org/10.1002/lt.500020207>.
  174. Lu, T.; Han, Y.; Zhang, R.; Zhang, K.; Lin, G.; Li, J. Quantitative Detection of Hepatitis C Virus RNA in Urine of Patients with Chronic Hepatitis C Using a Novel Real-time PCR Assay. *J. Med. Virol.* **2019**, *91*, 115–123. <https://doi.org/10.1002/jmv.25280>.
  175. Roy, K.M.; Bagg, J.; Bird, G.L.A.; Spence, E.; Follett, E.A.; Mills, P.R.; Lau, J.Y.N. Serological and Salivary Markers Compared with Biochemical Markers for Monitoring Interferon Treatment for Hepatitis C Virus Infection. *J. Med. Virol.* **1995**, *47*, 429–434. <https://doi.org/10.1002/jmv.1890470422>.
  176. Kage, M.; Ogasawara, S.; Kosai, K.-I.; Nakashima, E.; Shimamatsu, K.; Kojiro, M.; Kimura, A.; Fujisawa, T.; Matsukuma, Y.; Ito, Y.; et al. Hepatitis C Virus RNA Present in Saliva but Absent in Breast-Milk of the Hepatitis C Carrier Mother. *J. Gastroenterol. Hepatol.* **1997**, *12*, 518–521. <https://doi.org/10.1111/j.1440-1746.1997.tb00476.x>.
  177. Maggi, F.; Giorgi, M.; Fornai, C.; Morrica, A.; Vatteroni, M.L.; Pistello, M.; Siciliano, G.; Nuccorini, A.; Bendinelli, M. Detection and Quasispecies Analysis of Hepatitis C Virus in the Cerebrospinal Fluid of Infected Patients. *J. NeuroVirology* **1999**, *5*, 319–323. <https://doi.org/10.3109/13550289909015819>.
  178. Beld, M.; Sentjens, R.; Rebers, S.; Weel, J.; Wertheim-Van Dillen, P.; Sol, C.; Boom, R. Detection and Quantitation of Hepatitis C Virus RNA in Feces of Chronically Infected Individuals. *J. Clin. Microbiol.* **2000**, *38*, 3442–3444. <https://doi.org/10.1128/jcm.38.9.3442-3444.2000>.
  179. Heidrich, B.; Steinmann, E.; Plumeier, I.; Kirschner, J.; Sollik, L.; Ziegert, S.; Engelmann, M.; Lehmann, P.; Manns, M.P.; Pieper, D.H.; et al. Frequent Detection of HCV RNA and HCVcoreAg in Stool of Patients with Chronic Hepatitis C. *J. Clin. Virol.* **2016**, *80*, 1–7. <https://doi.org/10.1016/j.jcv.2016.04.006>.
  180. Monrroy, H.; Angulo, J.; Pino, K.; Labbé, P.; Miquel, J.F.; López-Lastra, M.; Soza, A. Detection of High Biliary and Fecal Viral Loads in Patients with Chronic Hepatitis C Virus Infection. *Gastroenterol. Hepatol.* **2017**, *40*, 339–347. <https://doi.org/10.1016/j.gastrohep.2017.01.004>.

181. Geng, Y.; Zhao, C.; Huang, W.; Harrison, T.J.; Zhang, H.; Geng, K.; Wang, Y. Detection and Assessment of Infectivity of Hepatitis E Virus in Urine. *J. Hepatol.* **2016**, *64*, 37–43. <https://doi.org/10.1016/j.jhep.2015.08.034>.
182. Moisset, X.; Vitello, N.; Bicilli, E.; Courtin, R.; Ferrier, A.; Taithe, F.; Lahaye, C.; Hssain, A.A.; Garrouste, C.; Pierre, C. Severe Bilateral Amyotrophic Neuralgia Associated with Major Dysphagia Secondary to Acute Hepatitis E. *F1000Research* **2013**, *2*, 259. <https://doi.org/10.12688/f1000research.2-259.v2>.
183. Silva, M.; Wicki, B.; Tsouni, P.; Cunningham, S.; Doerig, C.; Zanetti, G.; Aubert, V.; Sahli, R.; Moradpour, D.; Kuntzer, T. Hepatitis E Virus Infection as a Direct Cause of Neuralgic Amyotrophy. *Muscle Nerve* **2016**, *54*, 325–327. <https://doi.org/10.1002/mus.25096>.
184. Kamar, N.; Bendall, R.P.; Peron, J.M.; Cintas, P.; Prudhomme, L.; Mansuy, J.M.; Rostaing, L.; Keane, F.; Ijaz, S.; Izopet, J.; et al. Hepatitis E Virus and Neurologic Disorders. *Emerg. Infect. Dis.* **2011**, *17*, 173–179. <https://doi.org/10.3201/eid1702.100856>.
185. Aggarwal, R.; Kini, D.; Sofat, S.; Naik, S.R.; Krawczynski, K. Duration of Viraemia and Faecal Viral Excretion in Acute Hepatitis E. *Lancet* **2000**, *356*, 1081–1082. [https://doi.org/10.1016/S0140-6736\(00\)02737-9](https://doi.org/10.1016/S0140-6736(00)02737-9).
186. Takahashi, M.; Tanaka, T.; Azuma, M.; Kusano, E.; Aikawa, T.; Shibayama, T.; Yazaki, Y.; Mizuo, H.; Inoue, J.; Okamoto, H. Prolonged Fecal Shedding of Hepatitis E Virus (HEV) during Sporadic Acute Hepatitis E: Evaluation of Infectivity of HEV in Fecal Specimens in a Cell Culture System. *J. Clin. Microbiol.* **2007**, *45*, 3671–3679. <https://doi.org/10.1128/JCM.01086-07>.
187. Chandra, N.S.; Sharma, A.; Malhotra, B.; Rai, R.R. Dynamics of HEV Viremia, Fecal Shedding and Its Relationship with Transaminases and Antibody Response in Patients with Sporadic Acute Hepatitis E. *Viol. J.* **2010**, *7*, 213. <https://doi.org/10.1186/1743-422X-7-213>.
188. Comont, T.; Bonnet, D.; Sigur, N.; Gerdelat, A.; Legrand-Abravanel, F.; Kamar, N.; Alric, L. Acute hepatitisE Infection Associated with Guillain-Barré Syndrome in an Immunocompetent Patient. *La Rev. de Médecine Interne* **2014**, *35*, 333–336. <https://doi.org/10.1016/j.revmed.2013.05.005>.
189. Van Den Berg, B.; Van Der Eijk, A.A.; Pas, S.D.; Hunter, J.G.; Madden, R.G.; Tio-Gillen, A.P.; Dalton, H.R.; Jacobs, B.C. Guillain-Barré Syndrome Associated with Preceding Hepatitis E Virus Infection. *Neurology* **2014**, *82*, 491–497. <https://doi.org/10.1212/WNL.0000000000000111>.
190. Velay, A.; Kack-Kack, W.; Abravanel, F.; Lhomme, S.; Leyendecker, P.; Kremer, L.; Chamouard, P.; Izopet, J.; Fafi-Kremer, S.; Barth, H. Parsonage-Turner Syndrome Due to Autochthonous Acute Genotype 3f Hepatitis E Virus Infection in a Nonimmunocompromised 55-Year-Old Patient. *J. NeuroVirology* **2017**, *23*, 615–620. <https://doi.org/10.1007/s13365-017-0525-0>.
191. Fritz, M.; Berger, B.; Schemmerer, M.; Endres, D.; Wenzel, J.J.; Stich, O.; Panning, M. Pathological Cerebrospinal Fluid Findings in Patients with Neuralgic Amyotrophy and Acute Hepatitis e Virus Infection. *J. Infect. Dis.* **2018**, *217*, 1897–1901. <https://doi.org/10.1093/infdis/jiy128>.
192. Rivero-Juarez, A.; Frias, M.; Lopez-Lopez, P.; Martinez-Peinado, A.; Rialde, M.Á.; Brieva, T.; Machuca, I.; Camacho, Á.; García-Bocanegra, I.; Gomez-Villamandos, J.C.; et al. Detection of Hepatitis E Virus RNA in Saliva for Diagnosis of Acute Infection. *Zoonoses Public Health* **2018**, *65*, 584–588. <https://doi.org/10.1111/zph.12472>.
193. Goel, A.; Padmaprakash, K.V.; Benjamin, M.; Katiyar, H.; Aggarwal, R. Temporal Profile of HEV RNA Concentration in Blood and Stool from Patients with Acute Uncomplicated Hepatitis E in a Region with Genotype 1 Predominance. *J. Viral Hepat.* **2020**, *27*, 631–637. <https://doi.org/10.1111/jvh.13266>.
194. Rahmig, J.; Grey, A.; Berning, M.; Schaefer, J.; Lesser, M.; Reichmann, H.; Puetz, V.; Barlinn, K.; Siepmann, T. Disseminated Inflammation of the Central Nervous System Associated with Acute Hepatitis E: A Case Report. *BMC Neurol.* **2020**, *20*, 391. <https://doi.org/10.1186/s12883-020-01952-5>.
195. Fritz-Weltin, M.; Isenmann, N.; Frommherz, E.; Niedermeier, L.; Csernalabics, B.; Boettler, T.; Neumann-Haefelin, C.; Endres, D.; Panning, M.; Berger, B. Acute CNS Infections—Expanding the Spectrum of Neurological Manifestations of Hepatitis E Virus? *J. Neurol. Sci.* **2021**, *423*, 117387. <https://doi.org/10.1016/j.jns.2021.117387>.
196. Hafkesbrink, M.; Schemmerer, M.; Wenzel, J.J.; Isenmann, S. Acute Hepatitis E Virus Infection Presenting as Meningo-Encephalitis. *Infection* **2024**, *53*, 475–479. <https://doi.org/10.1007/s15010-024-02361-3>.
197. Uchino, K.; Miyoshi, T.; Mori, Y.; Komase, K.; Okayama, F.; Shibata, Y.; Yoshida, H.; Numata, T.; Takeda, M.; Tanaka, T. Comparison of Virological and Serological Methods for Laboratory Confirmation of Rubella. *J. Clin. Virol.* **2020**, *123*, 104257. <https://doi.org/10.1016/j.jcv.2019.104257>.
198. Mosquera, M.D.M.; Sanz, J.C.; Echevarría, J.E.; Herranz, N.; Fernández, M.; De Ory, F. Diagnostic Performance of Specific IgM Detection and Genomic Amplification in Rubella. *Enferm. Infecc. Y Microbiol. Clin.* **2006**, *24*, 251–253. [https://doi.org/10.1016/s0213-005x\(06\)73771-5](https://doi.org/10.1016/s0213-005x(06)73771-5).

199. Singh, M.P.; Kumar, A.; Gautam, N.; Khurana, J.; Gupta, M.; Ratho, R.K. Rubella Outbreak in the Union Territory of Chandigarh, North India. *J. Med. Virol.* **2015**, *87*, 344–349. <https://doi.org/10.1002/jmv.24056>.
200. Kanbayashi, D.; Kurata, T.; Kaida, A.; Kubo, H.; Yamamoto, S.P.; Egawa, K.; Hirai, Y.; Okada, K.; Kaida, Y.; Ikemori, R.; et al. Shedding of Rubella Virus in Postsymptomatic Individuals; Viral RNA Load Is a Potential Indicator to Estimate Candidate Patients Excreting Infectious Rubella Virus. *J. Clin. Virol.* **2023**, *160*, 105377. <https://doi.org/10.1016/j.jcv.2022.105377>.
201. Domonova, E.A.; Olu, S.; Kuevda, D.A.; Larichev, V.F.; Safonova, A.P.; Burchik, M.A.; Butenko, G.M.; Shipulin, G.A. [Detection of Rubella Virus RNA in Clinical Material by Real Time Polymerase Chain Reaction Method]. *Zh. Mikrobiol. Epidemiol. Immunobiol.* **2012**, *89*, 60–67.
202. del Mar Mosquera, M.; de Ory, F.; Moreno, M.; Echevarría, J.E. Simultaneous Detection of Measles Virus, Rubella Virus, and Parvovirus B19 by Using Multiplex PCR. *J. Clin. Microbiol.* **2002**, *40*, 111–116. <https://doi.org/10.1128/JCM.40.1.111-116.2002>.
203. Messedi, E.; Fki-Berrajah, L.; Gargouri, S.; Chouikha, A.; Chaari, A.; Bouaziz, M.; Jallouli, H.; Yahia, A.B.; Hammami, A.; Triki, H.; et al. Clinical Epidemiological and Molecular Aspects of Rubella Outbreak with High Number of Neurological Cases, Tunisia 2011–2012. *J. Clin. Virol.* **2014**, *61*, 248–254. <https://doi.org/10.1016/j.jcv.2014.07.003>.
204. Thomas, S.; Thomson, G.; Dowall, S.; Bruce, C.; Cook, N.; Easterbrook, L.; O'Donoghue, L.; Summers, S.; Ajazaj, L.; Hewson, R.; et al. Review of Crimean Congo Hemorrhagic Fever Infection in Kosova in 2008 and 2009: Prolonged Viremias and Virus Detected in Urine by PCR. *Vector-Borne Zoonotic Dis.* **2012**, *12*, 800–804. <https://doi.org/10.1089/vbz.2011.0776>.
205. Sahay, R.R.; Shete, A.M.; Yadav, P.D.; Patil, S.; Majumdar, T.; Jain, R.; Nyayanit, D.A.; Kaushal, H.; Panjwani, S.J.; Upadhyay, K.J.; et al. Sequential Determination of Viral Load, Humoral Responses and Phylogenetic Analysis in Fatal and Non-Fatal Cases of Crimean-Congo Hemorrhagic Fever Patients from Gujarat, India, 2019. *PLoS Negl. Trop. Dis.* **2021**, *15*, e0009718. <https://doi.org/10.1371/journal.pntd.0009718>.
206. Ito, Y.; Ichiyama, T.; Kimura, H.; Shibata, M.; Ishiwada, N.; Kuroki, H.; Furukawa, S.; Morishima, T. Detection of Influenza Virus RNA by Reverse Transcription-PCR and Proinflammatory Cytokines in Influenza-Virus-Associated Encephalopathy. *J. Med. Virol.* **1999**, *58*, 420–425. [https://doi.org/10.1002/\(sici\)1096-9071\(199908\)58:4<420::aid-jmv16>3.0.co;2-t](https://doi.org/10.1002/(sici)1096-9071(199908)58:4<420::aid-jmv16>3.0.co;2-t).
207. Kaiser, L.; Fritz, R.S.; Straus, S.E.; Gubareva, L.; Hayden, F.G. Symptom Pathogenesis during Acute Influenza: Interleukin-6 and Other Cytokine Responses. *J. Med. Virol.* **2001**, *64*, 262–268. <https://doi.org/10.1002/jmv.1045>.
208. Suryaprasad, A.; Morgan, O.W.; Peebles, P.; Warner, A.; Kerin, T.K.; Esona, M.D.; Bowen, M.D.; Sessions, W.; Xu, X.; Cromeans, T.; et al. Virus Detection and Duration of Illness among Patients with 2009 Pandemic Influenza a (H1N1) Virus Infection in Texas. *Clin. Infect. Dis.* **2011**, *52*, S109–S115. <https://doi.org/10.1093/cid/ciq014>.
209. Omari, I.; Breuer, O.; Kerem, E.; Berger, I. Neurological Complications and Pandemic Influenza A (H1N1) Virus Infection. *Acta Paediatr. Int. J. Paediatr.* **2011**, *100*, e12–e16. <https://doi.org/10.1111/j.1651-2227.2011.02188.x>.
210. Dilantika, C.; Sedyaningsih, E.R.; Kasper, M.R.; Agtini, M.; Listiyaningsih, E.; Uyeki, T.M.; Burgess, T.H.; Blair, P.J.; Putnam, S.D. Influenza Virus Infection among Pediatric Patients Reporting Diarrhea and Influenza-like Illness. *BMC Infect. Dis.* **2010**, *10*, 3. <https://doi.org/10.1186/1471-2334-10-3>.
211. Ng, S.; Ni, M.Y.; Fang, V.J.; Ip, D.K.M.; Chan, K.-H.; Leung, G.M.; Peiris, J.S.M.; Cowling, B.J. Characteristics of Vaccine Failures in a Randomized Placebo-Controlled Trial of Inactivated Influenza Vaccine in Children. *Pediatr. Infect. Dis. J.* **2014**, *33*, e63–e66. <https://doi.org/10.1097/INF.0000000000000064>.
212. McCullers, J.A.; Facchini, S.; Chesney, P.J.; Webster, R.G. Influenza B Virus Encephalitis. *Clin. Infect. Dis.* **1999**, *28*, 898–900. <https://doi.org/10.1086/515214>.
213. Hayase, Y.; Tobita, K. Probable Post-Influenza Cerebellitis. *Intern. Med.* **1997**, *36*, 747–749. <https://doi.org/10.2169/internalmedicine.36.747>.
214. Riddell, M.A.; Chibo, D.; Kelly, H.A.; Catton, M.G.; Birch, C.J. Investigation of Optimal Specimen Type and Sampling Time for Detection of Measles Virus RNA during a Measles Epidemic. *J. Clin. Microbiol.* **2001**, *39*, 375–376. <https://doi.org/10.1128/JCM.39.1.375-376.2001>.
215. Permar, S.R.; Moss, W.J.; Ryon, J.J.; Monze, M.; Cutts, F.; Quinn, T.C.; Griffin, D.E. Prolonged Measles Virus Shedding in Human Immunodeficiency Virus-Infected Children, Detected by Reverse Transcriptase-Polymerase Chain Reaction. *J. Infect. Dis.* **2001**, *183*, 532–538. <https://doi.org/10.1086/318533>.
216. Magurano, F.; Baggieri, M.; Fortuna, C.; Bella, A.; Filia, A.; Rota, M.C.; Benedetti, E.; Bucci, P.; Marchi, A.; Nicoletti, L. Measles Elimination in Italy: Data from Laboratory Activity, 2011–2013. *J. Clin. Virol.* **2015**, *64*, 34–39. <https://doi.org/10.1016/j.jcv.2014.12.019>.
217. Matsuzono, Y.; Narita, M.; Ishiguro, N.; Togashi, T. Detection of Measles Virus from Clinical Samples Using the Polymerase Chain Reaction. *Arch. Pediatr. Adolesc. Med.* **1994**, *148*, 289–293.

218. Nakayama, T.; Mori, T.; Yamaguchi, S.; Sonoda, S.; Asamura, S.; Yamashita, R.; Takeuchi, Y.; Urano, T. Detection of Measles Virus Genome Directly from Clinical Samples by Reverse Transcriptase-Polymerase Chain Reaction and Genetic Variability. *Virus Res.* **1995**, *35*, 1–16. [https://doi.org/10.1016/0168-1702\(94\)00074-M](https://doi.org/10.1016/0168-1702(94)00074-M).
219. Fox, A.; Hung, T.M.; Wertheim, H.; Hoa, L.N.M.; Vincent, A.; Lang, B.; Waters, P.; Ha, N.H.; Trung, N.V.; Farrar, J.; et al. Acute Measles Encephalitis in Partially Vaccinated Adults. *PLoS ONE* **2013**, *8*, e71671. <https://doi.org/10.1371/journal.pone.0071671>.
220. Yong, Y.K.; Chong, H.T.; Wong, K.T.; Tan, C.T.; Devi, S. Aetiology of Viral Central Nervous System Infection, a Malaysian Study. *Neurol. Asia* **2008**, *13*, 65–71.
221. Tan, K.E.; Anderson, M.; Krajden, M.; Petric, M.; Mak, A.; Naus, M. Mumps Virus Detection during an Outbreak in a Highly Unvaccinated Population in British Columbia. *Can. J. Public Health* **2011**, *102*, 47–50. <https://doi.org/10.1007/BF03404876>.
222. Ribas, M.d.L.A.; Tejero, Y.; Valcarcel, M.; Galindo, M.; Cordero, Y.; Sausy, A.; Muller, C.P.; Hübschen, J.M. Mumps Epidemiology in Cuba between 2004 and 2015. *Arch. Virol.* **2018**, *163*, 3059–3064. <https://doi.org/10.1007/s00705-018-3946-z>.
223. Krause, C.H.; Eastick, K.; Ogilvie, M.M. Real-Time PCR for Mumps Diagnosis on Clinical Specimens—Comparison with Results of Conventional Methods of Virus Detection and Nested PCR. *J. Clin. Virol.* **2006**, *37*, 184–189. <https://doi.org/10.1016/j.jcv.2006.07.009>.
224. Hatchette, T.F.; Davidson, R.; Clay, S.; Pettipas, J.; LeBlanc, J.; Sarwal, S.; Smieja, M.; Forward, K.R. Laboratory Diagnosis of Mumps in a Partially Immunized Population: The Nova Scotia Experience. *Can. J. Infect. Dis. Med. Microbiol.* **2009**, *20*, e157–e162. <https://doi.org/10.1155/2009/493275>.
225. Gouma, S.; Hahné, S.J.M.; Gijssels, D.B.; Koopmans, M.P.G.; van Binnendijk, R.S. Severity of Mumps Disease Is Related to MMR Vaccination Status and Viral Shedding. *Vaccine* **2016**, *34*, 1868–1873. <https://doi.org/10.1016/j.vaccine.2016.02.070>.
226. Nunn, A.; Masud, S.; Krajden, M.; Naus, M.; Jassem, A.N. Diagnostic Yield of Laboratory Methods and Value of Viral Genotyping during an Outbreak of Mumps in a Partially Vaccinated Population in British Columbia, Canada. *J. Clin. Microbiol.* **2018**, *56*, e01954–17. <https://doi.org/10.1128/JCM.01954-17>.
227. Uchida, K.; Shinohara, M.; Shimada, S.-I.; Segawa, Y.; Doi, R.; Gotoh, A.; Hondo, R. Rapid and Sensitive Detection of Mumps Virus RNA Directly from Clinical Samples by Real-Time PCR. *J. Med. Virol.* **2005**, *75*, 470–474. <https://doi.org/10.1002/jmv.20291>.
228. Yoshida, N.; Fujino, M.; Ota, Y.; Notomi, T.; Nakayama, T. Simple Differentiation Method of Mumps Hoshino Vaccine Strain from Wild Strains by Reverse Transcription Loop-Mediated Isothermal Amplification (RT-LAMP). *Vaccine* **2007**, *25*, 1281–1286. <https://doi.org/10.1016/j.vaccine.2006.09.093>.
229. Khalili, M.; Hajiabadi, H.R.; Akbari, M.; Esfahani, B.N.; Saleh, R.; Moghim, S. Viral Aetiology of Acute Central Nervous System Infections in Children, Iran. *J. Med. Microbiol.* **2022**, *71*, 001602. <https://doi.org/10.1099/jmm.0.001602>.
230. Valassina, M.; Meacci, F.; Valensin, P.E.; Cusi, M.G. Detection of Neurotropic Viruses Circulating in Tuscany: The Incisive Role of Toscana Virus. *J. Med. Virol.* **2000**, *60*, 86–90. [https://doi.org/10.1002/\(SICI\)1096-9071\(200001\)60:1<86::AID-JMV14>3.0.CO;2-N](https://doi.org/10.1002/(SICI)1096-9071(200001)60:1<86::AID-JMV14>3.0.CO;2-N).
231. Poggio, G.P.; Rodriguez, C.; Cisterna, D.; Freire, M.C.; Cello, J. Nested PCR for Rapid Detection of Mumps Virus in Cerebrospinal Fluid from Patients with Neurological Diseases. *J. Clin. Microbiol.* **2000**, *38*, 274–278.
232. Carr, M.J.; Moss, E.; Waters, A.; Dean, J.; Jin, L.; Coughlan, S.; Connell, J.; Hall, W.W.; Hassan, J. Molecular Epidemiological Evaluation of the Recent Resurgence in Mumps Virus Infections in Ireland. *J. Clin. Microbiol.* **2010**, *48*, 3288–3294. <https://doi.org/10.1128/JCM.00434-10>.
233. Hosseini, A.; Alborzi, A.; Ziyaeyan, M.; Jamalidoust, M.; Moeini, M.; Pouladfar, G.; Abbasian, A.; Kadivar, M.R. Viral Etiology of Aseptic Meningitis among Children in Southern Iran. *J. Med. Virol.* **2011**, *83*, 884–888. <https://doi.org/10.1002/jmv.22056>.
234. Mallewa, M.; Vallely, P.; Faragher, B.; Banda, D.; Klapper, P.; Mukaka, M.; Khofi, H.; Pensulo, P.; Taylor, T.; Molyneux, M.; et al. Viral CNS Infections in Children from a Malaria-Endemic Area of Malawi: A Prospective Cohort Study. *Lancet Glob. Health* **2013**, *1*, E153–E160. [https://doi.org/10.1016/S2214-109X\(13\)70060-3](https://doi.org/10.1016/S2214-109X(13)70060-3).
235. Bárcena-Panero, A.; De Ory, F.; Castellanos, A.; Echevarría, J.E.; Joan, A.C.; Domínguez, A.; García-Comas, L.; Godoy, P.; Guisasola, E.; Masa, J.; et al. Mumps-Associated Meningitis and Encephalitis in Patients with No Suspected Mumps Infection. *Diagn. Microbiol. Infect. Dis.* **2014**, *79*, 171–173. <https://doi.org/10.1016/j.diagmicrobio.2014.02.017>.
236. Cilla, G.; Montes, M.; Zapico, M.S.; Piñeiro, L.; Satrustegi, M.; Pérez-Yarza, E.G.; Pérez-Trallero, E. Genetic Characterization of Historical Epidemic Mumps Viruses in Northern Spain, 1987–1990. *Infect. Genet. Evol.* **2014**, *28*, 5–10. <https://doi.org/10.1016/j.meegid.2014.08.025>.
237. Rasti, M.; Makvandi, M.; Neisi, N.; Azaran, A.; Rastegarvand, N.; Khalafkhany, D.; Jahangirnezhad, E.; Teimoori, A.; Hadian, M.; Shabani, A.; et al. Three Cases of Mumps Virus and Enterovirus Coinfection in Children with Enteroviral Meningitis. *Medicine* **2016**, *95*, e5610. <https://doi.org/10.1097/MD.00000000000005610>.

238. Taherkhani, R.; Farshadpour, F. Molecular Identification and Clinical Characteristics of Mumps Virus and Human Herpesviruses Associated with Aseptic Meningitis in South of Iran. *VirusDisease* **2021**, *32*, 666–673. <https://doi.org/10.1007/s13337-021-00718-y>.
239. Safavi, M.; Taghipour, S.; Vasei, M.; Eshaghi, H.; Haghi Ashtiani, M.T. Evaluation of Human Bocavirus as Well as Other Well-Known Viral Etiologic Agents by PCR in the Cerebrospinal Fluid of Children with Clinical Impression of Viral Meningoencephalitis Referred to the Children's Medical Center in Tehran, Iran, from 2019 to 2020. *J. Med. Virol.* **2022**, *94*, 4944–4949. <https://doi.org/10.1002/jmv.27930>.
240. Li, W.; Feng, Y.; Zhong, H.; Jiang, M.; Zhang, J.; Lin, S.; Chen, N.; He, S.; Zhang, K.; Fu, S.; et al. Incongruence between Confirmed and Suspected Clinical Cases of Japanese Encephalitis Virus Infection. *Front. Cell. Infect. Microbiol.* **2024**, *14*, 1302314. <https://doi.org/10.3389/fcimb.2024.1302314>.
241. Chadha, M.S.; Comer, J.A.; Lowe, L.; Rota, P.A.; Rollin, P.E.; Bellini, W.J.; Ksiazek, T.G.; Mishra, A.C. Nipah Virus-Associated Encephalitis Outbreak, Siliguri, India. *Emerg. Infect. Dis.* **2006**, *12*, 235–240. <https://doi.org/10.3201/eid1202.051247>.
242. Yadav, P.D.; Sahay, R.R.; Balakrishnan, A.; Mohandas, S.; Radhakrishnan, C.; Gokhale, M.D.; Balasubramanian, R.; Abraham, P.; Gupta, N.; Sugunan, A.P.; et al. Nipah Virus Outbreak in Kerala State, India Amidst of COVID-19 Pandemic. *Front. Public Health* **2022**, *10*, 818545. <https://doi.org/10.3389/fpubh.2022.818545>.
243. Arunkumar, G.; Chandni, R.; Mourya, D.T.; Singh, S.K.; Sadanandan, R.; Sudan, P.; Bhargava, B. Outbreak Investigation of Nipah Virus Disease in Kerala, India, 2018. *J. Infect. Dis.* **2019**, *219*, 1867–1878. <https://doi.org/10.1093/infdis/jiy612>.
244. Hassan, Z.; Sazzad, H.M.; Luby, S.P.; Sturm-Ramirez, K.; Bhuiyan, M.U.; Rahman, M.Z.; Islam, M.; Ströher, U.; Sultana, S.; Kafi, M.A.H.; et al. Nipah Virus Contamination of Hospital Surfaces during Outbreaks, Bangladesh, 2013–2014. *Emerg. Infect. Dis.* **2018**, *24*, 15–21. <https://doi.org/10.3201/eid2401.161758>.
245. Kalimuddin, S.; Sessions, O.M.; Hou, Y.; Ooi, E.E.; Sim, D.; Kumaraswamy, S.; Tan, T.E.; Lai, S.H.; Low, C.Y. Successful Clearance of Human Parainfluenza Virus Type 2 Viraemia with Intravenous Ribavirin and Immunoglobulin in a Patient with Acute Myocarditis. *J. Clin. Virol.* **2013**, *56*, 37–40. <https://doi.org/10.1016/j.jcv.2012.10.005>.
246. Shen, L.; Yan, H.; Li, W.; Tian, Y.; Lin, C.; Liu, B.; Wang, Y.; Jia, L.; Zhang, D.; Yang, P.; et al. Occurrence of Respiratory Viruses among Outpatients with Diarrhea in Beijing, China, 2019–2020. *Front. Microbiol.* **2023**, *13*, 1073980. <https://doi.org/10.3389/FMICB.2022.1073980>.
247. Pomari, E.; Matucci, A.; Accordini, S.; Mantovani, R.P.; Ganesini, N.; Mori, A.; Castilletti, C. ddPCR for the Detection and Absolute Quantification of Oropouche Virus. *Viruses* **2024**, *16*, 1426. <https://doi.org/10.3390/v16091426>.
248. Fonseca, L.M.d.S.; Carvalho, R.H.; Bandeira, A.C.; Sardi, S.I.; Campos, G.S. Oropouche Virus Detection in Febrile Patients' Saliva and Urine Samples in Salvador, Bahia, Brazil. *Jpn. J. Infect. Dis.* **2020**, *73*, 164–165. <https://doi.org/10.7883/yoken.JJID.2019.296>.
249. Cardoso, B.F.; Serra, O.P.; Heinen, L.B.D.S.; Zuchi, N.; de Souza, V.C.; Naveca, F.G.; Dos Santos, M.A.M.; Shlessarenko, R.D. Detection of Oropouche Virus Segment S in Patients and in *Culex Quinquefasciatus* in the State of Mato Grosso, Brazil. *Mem. Inst. Oswaldo Cruz* **2015**, *110*, 745–754. <https://doi.org/10.1590/0074-02760150123>.
250. Martins-Luna, J.; del Valle-Mendoza, J.; Silva-Caso, W.; Sandoval, I.; del Valle, L.J.; Palomares-Reyes, C.; Carrillo-Ng, H.; Peña-Tuesta, I.; Aguilar-Luis, M.A. Oropouche Infection a Neglected Arbovirus in Patients with Acute Febrile Illness from the Peruvian Coast. *BMC Res. Notes* **2020**, *13*, 67. <https://doi.org/10.1186/s13104-020-4937-1>.
251. Weidmann, M.; Rudaz, V.; Nunes, M.R.T.; Vasconcelos, P.F.C.; Hufert, F.T. Rapid Detection of Human Pathogenic Orthobunyaviruses. *J. Clin. Microbiol.* **2003**, *41*, 3299–3305. <https://doi.org/10.1128/JCM.41.7.3299-3305.2003>.
252. Alva-Urcia, C.; Aguilar-Luis, M.A.; Palomares-Reyes, C.; Silva-Caso, W.; Suarez-Ognio, L.; Weilg, P.; Manrique, C.; Vasquez-Achaya, F.; Del Valle, L.J.; Del Valle-Mendoza, J. Emerging and Reemerging Arboviruses: A New Threat in Eastern Peru. *PLoS ONE* **2017**, *12*, e0187897. <https://doi.org/10.1371/journal.pone.0187897>.
253. Wise, E.L.; Pullan, S.T.; Márquez, S.; Paz, V.; Mosquera, J.D.; Zapata, S.; Jackson, S.K.; Fejer, G.; Trueba, G.; Logue, C.H. Isolation of Oropouche Virus from Febrile Patient, Ecuador. *Emerg. Infect. Dis.* **2018**, *24*, 935–937. <https://doi.org/10.3201/eid2405.171569>.
254. de Souza Costa, M.C.; Siqueira Maia, L.M.; Costa de Souza, V.; Gonzaga, A.M.; Correa de Azevedo, V.; Ramos Martins, L.; Chavez Pavoni, J.H.; Gomes Naveca, F.; Dezengrini Shlessarenko, R. Arbovirus Investigation in Patients from Mato Grosso during Zika and Chikungunya Virus Introduction in Brazil, 2015–2016. *Acta Trop.* **2019**, *190*, 395–402. <https://doi.org/10.1016/j.actatropica.2018.12.019>.
255. Ciuderis, K.A.; Berg, M.G.; Perez, L.J.; Hadji, A.; Perez-Restrepo, L.S.; Aristizabal, L.C.; Forberg, K.; Yamaguchi, J.; Cardona, A.; Weiss, S.; et al. Oropouche Virus as an Emerging Cause of Acute Febrile Illness in Colombia. *Emerg. Microbes Infect.* **2022**, *11*, 2645–2657. <https://doi.org/10.1080/22221751.2022.2136536>.

256. Bastos, M.S.; Lessa, N.; Naveca, F.G.; Monte, R.L.; Braga, W.S.; Figueiredo, L.T.M.; Ramasawmy, R.; Mourão, M.P.G. Detection of Herpesvirus, Enterovirus, and Arbovirus Infection in Patients with Suspected Central Nervous System Viral Infection in the Western Brazilian Amazon. *J. Med. Virol.* **2014**, *86*, 1522–1527. <https://doi.org/10.1002/jmv.23953>.
257. Bastos, M.D.S.; Figueiredo, L.T.M.; Naveca, F.G.; Monte, R.L.; Lessa, N.; De Figueiredo, R.M.P.; Gimaque, J.B.D.L.; João, G.P.; Ramasawmy, R.; Mourão, M.P.G. Short Report: Identification of Oropouche Orthobunyavirus in the Cerebrospinal Fluid of Three Patients in the Amazonas, Brazil. *Am. J. Trop. Med. Hyg.* **2012**, *86*, 732–735. <https://doi.org/10.4269/ajtmh.2012.11-0485>.
258. Bird, B.H.; Bawiec, D.A.; Ksiazek, T.G.; Shoemaker, T.R.; Nichol, S.T. Highly Sensitive and Broadly Reactive Quantitative Reverse Transcription-PCR Assay for High-Throughput Detection of Rift Valley Fever Virus. *J. Clin. Microbiol.* **2007**, *45*, 3506–3513. <https://doi.org/10.1128/JCM.00936-07>.
259. Rosen, B.I.; Fangc, Z.Y.; Glass, R.I.; Monroe, S.S. Cloning of Human Picobirnavirus Genomic Segments and Development of an RT-PCR Detection Assay. *Virology* **2000**, *277*, 316–329. <https://doi.org/10.1006/viro.2000.0594>.
260. Bhattacharya, R.; Sahoo, G.C.; Nayak, M.K.; Rajendran, K.; Dutta, P.; Mitra, U.; Bhattacharya, M.K.; Naik, T.N.; Bhattacharya, S.K.; Krishnan, T. Detection of Genogroup I and II Human Picobirnaviruses Showing Small Genomic RNA Profile Causing Acute Watery Diarrhoea among Children in Kolkata, India. *Infect. Genet. Evol.* **2007**, *7*, 229–238. <https://doi.org/10.1016/j.meegid.2006.09.005>.
261. Ganesh, B.; Nataraju, S.M.; Rajendran, K.; Ramamurthy, T.; Kanungo, S.; Manna, B.; Nagashima, S.; Sur, D.; Kobayashi, N.; Krishnan, T. Detection of Closely Related Picobirnaviruses among Diarrhoeic Children in Kolkata: Evidence of Zoonoses? *Infect. Genet. Evol.* **2010**, *10*, 511–516. <https://doi.org/10.1016/j.meegid.2010.02.008>.
262. Ganesh, B.; Nagashima, S.; Ghosh, S.; Nataraju, S.M.; Rajendran, K.; Manna, B.; Ramamurthy, T.; Niyogi, S.K.; Kanungo, S.; Sur, D.; et al. Detection and Molecular Characterization of Multiple Strains of Picobirnavirus Causing Mixed Infection in a Diarrhoeic Child: Emergence of Prototype Genogroup Ii-like Strain in Kolkata, India. *Int. J. Mol. Epidemiol. Genet.* **2011**, *2*, 61–72.
263. Kapusinszky, B.; Minor, P.; Delwart, E. Nearly Constant Shedding of Diverse Enteric Viruses by Two Healthy Infants. *J. Clin. Microbiol.* **2012**, *50*, 3427–3434. <https://doi.org/10.1128/JCM.01589-12>.
264. Wang, Y.; Zou, G.; Xia, A.; Wang, X.; Cai, J.; Gao, Q.; Yuan, S.; He, G.; Zhang, S.; Zeng, M.; et al. Enterovirus 71 Infection in Children with Hand, Foot, and Mouth Disease in Shanghai, China: Epidemiology, Clinical Feature and Diagnosis. *Virol. J.* **2015**, *12*, 83. <https://doi.org/10.1186/s12985-015-0308-2>.
265. Han, J.; Ma, X.-J.; Wan, J.-F.; Liu, Y.-H.; Han, Y.-L.; Chen, C.; Tian, C.; Gao, C.; Wang, M.; Dong, X.-P. Long Persistence of EV71 Specific Nucleotides in Respiratory and Feces Samples of the Patients with Hand-Foot-Mouth Disease after Recovery. *BMC Infect. Dis.* **2010**, *10*, 178. <https://doi.org/10.1186/1471-2334-10-178>.
266. Casas-Alba, D.; De Sevilla, M.F.; Valero-Rello, A.; Fortuny, C.; García-García, J.-J.; Ortez, C.; Muchart, J.; Armangué, T.; Jordan, I.; Luaces, C.; et al. Outbreak of Brainstem Encephalitis Associated with Enterovirus-A71 in Catalonia, Spain (2016): A Clinical Observational Study in a Children’s Reference Centre in Catalonia. *Clin. Microbiol. Infect.* **2017**, *23*, 874–881. <https://doi.org/10.1016/j.cmi.2017.03.016>.
267. Taravilla, C.N.; Pérez-Sebastián, I.; Salido, A.G.; Serrano, C.V.; Extremera, V.C.; Rodríguez, A.D.; Marín, L.L.; Sanz, M.A.; Traba, O.M.S.; González, A.S. Enterovirus A71 Infection and Neurologic Disease, Madrid, Spain, 2016. *Emerg. Infect. Dis.* **2019**, *25*, 25–32. <https://doi.org/10.3201/eid2501.181089>.
268. Joshi, M.S.; Bhalla, S.; Kalrao, V.R.; Dhongade, R.K.; Chitambar, S.D. Exploring the Concurrent Presence of Hepatitis A Virus Genome in Serum, Stool, Saliva, and Urine Samples of Hepatitis A Patients. *Diagn. Microbiol. Infect. Dis.* **2014**, *78*, 379–382. <https://doi.org/10.1016/j.diagmicrobio.2013.12.013>.
269. Munné, M.S.; Velasco, M.C.C.; Moreira, R.; Vladimirovsky, S.; Otegui, L.; Castro, R.; Brajterman, L.; Soto, S.; Mutti, J.; Nucifora, S.; et al. Duration of Viremia and Fecal Shedding of the Virus in Hepatitis A Infected Children. *Acta Gastroenterol. Latinoam.* **2006**, *36*, 182–189.
270. Tjon, G.M.S.; Coutinho, R.A.; Van Den Hoek, A.; Esmán, S.; Wijkman, C.J.; Hoebe, C.J.P.A.; Wolters, B.; Swaan, C.; Geskus, R.B.; Dukers, N.; et al. High and Persistent Excretion of Hepatitis A Virus in Immunocompetent Patients. *J. Med. Virol.* **2006**, *78*, 1398–1405. <https://doi.org/10.1002/jmv.20711>.
271. Leon, L.A.A.; De Almeida, A.J.; De Paula, V.S.; Tourinho, R.S.; Villela, D.A.M.; Gaspar, A.M.C.; Lewis-Ximenez, L.L.; Pinto, M.A. Longitudinal Study of Hepatitis A Infection by Saliva Sampling: The Kinetics of HAV Markers in Saliva Revealed the Application of Saliva Tests for Hepatitis A Study. *PLoS ONE* **2015**, *10*, e0145454. <https://doi.org/10.1371/journal.pone.0145454>.
272. Ishizaka, A.; Koga, M.; Mizutani, T.; Lim, L.A.; Adachi, E.; Ikeuchi, K.; Ueda, R.; Aoyagi, H.; Tanaka, S.; Kiyono, H.; et al. Prolonged Gut Dysbiosis and Fecal Excretion of Hepatitis A Virus in Patients Infected with Human Immunodeficiency Virus. *Viruses* **2021**, *13*, 2101. <https://doi.org/10.3390/v13102101>.

273. Xatzipsalti, M.; Kyrana, S.; Tsolia, M.; Psarras, S.; Bossios, A.; Laza-Stanca, V.; Johnston, S.L.; Papadopoulos, N.G. Rhinovirus Viremia in Children with Respiratory Infections. *Am. J. Respir. Crit. Care Med.* **2005**, *172*, 1037–1040. <https://doi.org/10.1164/rccm.200502-315OC>.
274. Fuji, N.; Suzuki, A.; Lupisan, S.; Sombrero, L.; Galang, H.; Kamigaki, T.; Tamaki, R.; Saito, M.; Aniceto, R.; Olveda, R.; et al. Detection of Human Rhinovirus C Viral Genome in Blood among Children with Severe Respiratory Infections in the Philippines. *PLoS ONE* **2011**, *6*, e27247. <https://doi.org/10.1371/journal.pone.0027247>.
275. Lu, X.; Schneider, E.; Jain, S.; Bramley, A.M.; Hymas, W.; Stockmann, C.; Ampofo, K.; Arnold, S.R.; Williams, D.J.; Self, W.H.; et al. Rhinovirus Viremia in Patients Hospitalized with Community-Acquired Pneumonia. *J. Infect. Dis.* **2017**, *216*, 1104–1111. <https://doi.org/10.1093/infdis/jix455>.
276. Baillie, V.L.; Moore, D.P.; Mathunjwa, A.; Morailane, P.; Simões, E.A.F.; Madhi, S.A. A Prospective Case-Control Study on the Association of Rhinovirus Nasopharyngeal Viral Load and Viremia in South African Children Hospitalized with Severe Pneumonia. *J. Clin. Virol.* **2020**, *125*, 104288. <https://doi.org/10.1016/j.jcv.2020.104288>.
277. Kling, S.; Donninger, H.; Williams, Z.; Vermeulen, J.; Weinberg, E.; Latiff, K.; Ghildyal, R.; Bardin, P. Persistence of Rhinovirus RNA after Asthma Exacerbation in Children. *Clin. Exp. Allergy* **2005**, *35*, 672–678. <https://doi.org/10.1111/j.1365-2222.2005.02244.x>.
278. Wood, L.G.; Powell, H.; Grissell, T.V.; Davies, B.; Shafren, D.R.; Whitehead, B.F.; Hensley, M.J.; Gibson, P.G. Persistence of Rhinovirus RNA and IP-10 Gene Expression after Acute Asthma. *Respirology* **2011**, *16*, 291–299. <https://doi.org/10.1111/j.1440-1843.2010.01897.x>.
279. Loeffelholz, M.J.; Trujillo, R.; Pyles, R.B.; Miller, A.L.; Alvarez-Fernandez, P.; Pong, D.L.; Chonmaitree, T. Duration of Rhinovirus Shedding in the Upper Respiratory Tract in the First Year of Life. *Pediatrics* **2014**, *134*, 1144–1150. <https://doi.org/10.1542/peds.2014-2132>.
280. Harvala, H.; McIntyre, C.L.; McLeish, N.J.; Kondracka, J.; Palmer, J.; Molyneaux, P.; Gunson, R.; Bennett, S.; Templeton, K.; Simmonds, P. High Detection Frequency and Viral Loads of Human Rhinovirus Species A to C in Fecal Samples; Diagnostic and Clinical Implications. *J. Med. Virol.* **2012**, *84*, 536–542. <https://doi.org/10.1002/jmv.23203>.
281. Savolainen-Kopra, C.; Simonen-Tikka, M.-L.; Klemola, P.; Blomqvist, S.; Suomenrinne, S.; Nantö-Salonen, K.; Simell, O.; Roivainen, M. Human Rhinoviruses in INDIS-Study Material-Evidence for Recovery of Viable Rhinovirus from Fecal Specimens. *J. Med. Virol.* **2013**, *85*, 1466–1472. <https://doi.org/10.1002/jmv.23593>.
282. Capaul, S.E.; Gorgievski-Hrisoho, M. Detection of Enterovirus RNA in Cerebrospinal Fluid (CSF) Using NucliSens EasyQ Enterovirus Assay. *J. Clin. Virol.* **2005**, *32*, 236–240. <https://doi.org/10.1016/j.jcv.2004.08.006>.
283. Maggi, F.; Pifferi, M.; Vatteroni, M.; Fornai, C.; Tempestini, E.; Anzilotti, S.; Lanini, L.; Andreoli, E.; Ragazzo, V.; Pistello, M.; et al. Human Metapneumovirus Associated with Respiratory Tract Infections in a 3-Year Study of Nasal Swabs from Infants in Italy. *J. Clin. Microbiol.* **2003**, *41*, 2987–2991. <https://doi.org/10.1128/JCM.41.7.2987-2991.2003>.
284. Fernández, I.S.; Polo, M.R.; Muñoz-Almagro, C.; Carretero, L.M.; Muñoz, A.R.; Roura, R.C.; Dueñas, B.P. Human Metapneumovirus in the Cerebrospinal Fluid of a Patient With Acute Encephalitis. *Arch. Neurol.* **2012**, *69*, 649–652. <https://doi.org/10.1001/archneurol.2011.1094>.
285. Ebihara, T.; Endo, R.; Kikuta, H.; Ishiguro, N.; Ishiko, H.; Hara, M.; Takahashi, Y.; Kobayashi, K. Human Metapneumovirus Infection in Japanese Children. *J. Clin. Microbiol.* **2004**, *42*, 126–132. <https://doi.org/10.1128/JCM.42.1.126-132.2004>.
286. Arnold, J.C.; Singh, K.K.; Milder, E.; Spector, S.A.; Sawyer, M.H.; Gavalì, S.; Glaser, C. Human Metapneumovirus Associated with Central Nervous System Infection in Children. *Pediatr. Infect. Dis. J.* **2009**, *28*, 1057–1060. <https://doi.org/10.1097/INF.0b013e3181acd221>.
287. Niizuma, T.; Okumura, A.; Kinoshita, K.; Shimizu, T. Acute Encephalopathy Associated with Human Metapneumovirus Infection. *Jpn J. Infect. Dis.* **2014**, *67*, 213–215. <https://doi.org/10.7883/yoken.67.213>.
288. Yui, I.; Hoshi, A.; Shigeta, Y.; Takami, T.; Nakayama, T. Detection of Human Respiratory Syncytial Virus Sequences in Peripheral Blood Mononuclear Cells. *J. Med. Virol.* **2003**, *70*, 481–489. <https://doi.org/10.1002/jmv.10421>.
289. Kokturk, N.; Bozdayi, G.; Yilmaz, S.; Doğan, B.; Gulbahar, O.; Rota, S.; Tatlicioglu, T. Detection of Adenovirus and Respiratory Syncytial Virus in Patients with Chronic Obstructive Pulmonary Disease: Exacerbation versus Stable Condition. *Mol. Med. Rep.* **2015**, *12*, 3039–3046. <https://doi.org/10.3892/mmr.2015.3681>.
290. Sugimoto, M.; Morichi, S.; Kashiwagi, Y.; Suzuki, S.; Nishimata, S.; Yamanaka, G.; Sawada, A.; Kawashima, H. A Case of Respiratory Syncytial Virus-Associated Encephalopathy in Which the Virus Was Detected in Cerebrospinal Fluid and Intratracheal Aspiration despite Negative Rapid Test Results. *J. Infect. Chemother.* **2020**, *26*, 393–396. <https://doi.org/10.1016/j.jiac.2019.11.008>.

291. Zlateva, K.T.; Van Ranst, M. Detection of Subgroup B Respiratory Syncytial Virus in the Cerebrospinal Fluid of a Patient with Respiratory Syncytial Virus Pneumonia. *Pediatr. Infect. Dis. J.* **2004**, *23*, 1065–1066. <https://doi.org/10.1097/01.inf.0000143654.12493.c9>.
292. Lee, F.E.-H.; Walsh, E.E.; Falsey, A.R. The Effect of Steroid Use in Hospitalized Adults with Respiratory Syncytial Virus-Related Illness. *Chest* **2011**, *140*, 1156–1161. <https://doi.org/10.1378/chest.11-0047>.
293. Cunningham, S.; Piedra, P.A.; Martinon-Torres, F.; Szymanski, H.; Brackeva, B.; Dombrecht, E.; Detalle, L.; Fleurinck, C.; Verhulst, S.; Matthijs, I.; et al. Nebulised ALX-0171 for Respiratory Syncytial Virus Lower Respiratory Tract Infection in Hospitalised Children: A Double-Blind, Randomised, Placebo-Controlled, Phase 2b Trial. *Lancet Respir. Med.* **2021**, *9*, 21–32. [https://doi.org/10.1016/S2213-2600\(20\)30320-9](https://doi.org/10.1016/S2213-2600(20)30320-9).
294. Lui, G.; Wong, C.K.; Chan, M.; Chong, K.C.; Wong, R.; Chu, I.; Zhang, M.; Li, T.; Hui, D.S.C.; Lee, N.; et al. Host Inflammatory Response Is the Major Marker of Severe Respiratory Syncytial Virus Infection in Older Adults. *J. Infect.* **2021**, *83*, 686–692. <https://doi.org/10.1016/j.jinf.2021.09.024>.
295. Esposito, S.; Scarselli, E.; Lelii, M.; Scala, A.; Vitelli, A.; Capone, S.; Fornili, M.; Biganzoli, E.; Orenti, A.; Nicosia, A.; et al. Antibody Response to Respiratory Syncytial Virus Infection in Children <18 Months Old. *Hum. Vaccines Immunother.* **2016**, *12*, 1700. <https://doi.org/10.1080/21645515.2016.1145847>.
296. Erez, D.L.; Yarden-Bilavsky, H.; Mendelson, E.; Yuhas, Y.; Ashkenazi, S.; Nahum, E.; Berent, E.; Hindiyeh, M.; Bilavsky, E. Apnea Induced by Respiratory Syncytial Virus Infection Is Not Associated with Viral Invasion of the Central Nervous System. *Pediatr. Infect. Dis. J.* **2014**, *33*, 880–881. <https://doi.org/10.1097/INF.0000000000000311>.
297. Chakrabarti, A.K.; Caruso, L.; Ding, M.; Shen, C.; Buchanan, W.; Gupta, P.; Rinaldo, C.R.; Chen, Y. Detection of HIV-1 RNA/DNA and CD4 mRNA in Feces and Urine from Chronic HIV-1 Infected Subjects with and without Anti-Retroviral Therapy. *AIDS Res. Ther.* **2009**, *6*, 20. <https://doi.org/10.1186/1742-6405-6-20>.
298. Mzingwane, M.L.; Hunt, G.; Lassauniere, R.; Kalimashe, M.; Bongwe, A.; Ledwaba, J.; Chaisson, R.E.; Martinson, N.; Richter, K.; Bowyer, S.M.; et al. Detection and Molecular Characterization of Urinary Tract HIV-1 Populations. *Ann. Clin. Microbiol. Antimicrob.* **2019**, *18*, 27. <https://doi.org/10.1186/s12941-019-0326-9>.
299. Kiviat, N.B.; Critchlow, C.W.; Hawes, S.E.; Kuypers, J.; Surawicz, C.; Goldbaum, G.; van Burik, J.; Lampinen, T.; Holmes, K.K. Determinants of Human Immunodeficiency Virus DNA and RNA Shedding in the Anal-Rectal Canal of Homosexual Men. *J. Infect. Dis.* **1998**, *177*, 571–578. <https://doi.org/10.1086/514239>.
300. Zuckerman, R.A.; Whittington, W.L.H.; Celum, C.L.; Collis, T.K.; Lucchetti, A.J.; Sanchez, J.L.; Hughes, J.P.; Coombs, R.W. Higher Concentration of HIV RNA in Rectal Mucosa Secretions than in Blood and Seminal Plasma, among Men Who Have Sex with Men, Independent of Antiretroviral Therapy. *J. Infect. Dis.* **2004**, *190*, 156–161. <https://doi.org/10.1086/421246>.
301. Yapijakis, C.; Panis, V.; Koufaliotis, N.; Yfanti, G.; Karachalios, S.; Roumeliotou, A.; Mantzavinos, Z. Immunological and Molecular Detection of Human Immunodeficiency Virus in Saliva, and Comparison with Blood Testing. *Eur. J. Oral Sci.* **2006**, *114*, 175–179. <https://doi.org/10.1111/j.1600-0722.2006.00352.x>.
302. Wahl, S.M.; Redford, M.; Christensen, S.; Mack, W.; Cohn, J.; Janoff, E.N.; Mestecky, J.; Jenson, H.B.; Navazesh, M.; Cohen, M.; et al. Systemic and Mucosal Differences in HIV Burden, Immune, and Therapeutic Responses. *J. Acquir. Immune Defic. Syndr.* **2011**, *56*, 401–411. <https://doi.org/10.1097/QAI.0b013e31820cdfdb>.
303. Fernández-González, M.; García, J.A.; Padilla, S.; García-Abellán, J.; Agulló, V.; Gutiérrez, F.; Masiá, M. Rectal and Seminal HIV-1 RNA Decay towards Virological Suppression in Infected MSM Initiating Dolutegravir/Abacavir/Lamivudine. *J. Antimicrob. Chemother.* **2020**, *75*, 668–674. <https://doi.org/10.1093/jac/dkz482>.
304. Liuzzi, G.; Chirianni, A.; Clementi, M.; Bagnarelli, P.; Valenza, A.; Cataldo, P.T.; Piazza, M. Analysis of HIV-1 Load in Blood, Semen and Saliva: Evidence for Different Viral Compartments in a Cross-Sectional and Longitudinal Study. *AIDS* **1996**, *10*, F51–F56. <https://doi.org/10.1097/00002030-199612000-00001>.
305. Pilcher, C.D.; Shugars, D.C.; Fiscus, S.A.; Miller, W.C.; Menezes, P.; Giner, J.; Dean, B.; Robertson, K.; Hart, C.E.; Lennox, J.L.; et al. HIV in Body Fluids during Primary HIV Infection: Implications for Pathogenesis, Treatment and Public Health. *AIDS* **2001**, *15*, 837–845. <https://doi.org/10.1097/00002030-200105040-00004>.
306. Yagyu, F.; Ikeda, Y.; Ariyoshi, K.; Sugiura, W.; Wongkhomthong, S.-A.; Masuda, M.; Ushijima, H. Differentiation of Subtypes B and E of Human Immunodeficiency Virus Type 1 by Polymerase Chain Reaction Using Novel Env Gene Primers. *J. Virol. Methods* **2002**, *101*, 11–20. [https://doi.org/10.1016/S0166-0934\(01\)00415-3](https://doi.org/10.1016/S0166-0934(01)00415-3).
307. Twigg, H.L., III; Weiden, M.; Valentine, F.; Schnizlein-Bick, C.T.; Bassett, R.; Zheng, L.; Wheat, J.; Day, R.B.; Rominger, H.; Collman, R.G.; et al. Effect of Highly Active Antiretroviral Therapy on Viral Burden in the Lungs of HIV-Infected Subjects. *J. Infect. Dis.* **2008**, *197*, 109–116. <https://doi.org/10.1086/523766>.

308. Sturdevant, C.B.; Joseph, S.B.; Schnell, G.; Price, R.W.; Swanstrom, R.; Spudich, S. Compartmentalized Replication of R5 T Cell-Tropic HIV-1 in the Central Nervous System Early in the Course of Infection. *PLoS Pathog.* **2015**, *11*, e1004720. <https://doi.org/10.1371/journal.ppat.1004720>.
309. Phanuphak, N.; Pattanachaiwit, S.; Pankam, T.; Teeratakulpisarn, N.; Chamnan, P.; Pathipvanich, P.; Thongpaen, S.; Nonenoy, S.; Jantarapakde, J.; Pengnonyang, S.; et al. Sexually Transmitted Infections and HIV RNA Levels in Blood and Anogenital Compartments among Thai Men Who Have Sex with Men before and after Antiretroviral Therapy: Implication for Treatment as Prevention Programme. *J. Int. AIDS Soc.* **2018**, *21*, e25186. <https://doi.org/10.1002/jia2.25186>.
310. Wacharapluesadee, S.; Hemachudha, T. Urine Samples for Rabies RNA Detection in the Diagnosis of Rabies in Humans. *Clin. Infect. Dis.* **2002**, *34*, 874–875. <https://doi.org/10.1086/338872>.
311. Mani, R.S.; Madhusudana, S.N.; Mahadevan, A.; Reddy, V.; Belludi, A.Y.; Shankar, S.K. Utility of Real-Time Taqman PCR for Antemortem and Postmortem Diagnosis of Human Rabies. *J. Med. Virol.* **2014**, *86*, 1804–1812. <https://doi.org/10.1002/jmv.23814>.
312. Crepin, P.; Audry, L.; Rotivel, Y.; Gacoin, A.; Caroff, C.; Bourhy, H. Intravital Diagnosis of Human Rabies by PCR Using Saliva and Cerebrospinal Fluid. *J. Clin. Microbiol.* **1998**, *36*, 1117–1121. <https://doi.org/10.1128/jcm.36.4.1117-1121.1998>.
313. Susilawathi, N.M.; Darwinata, A.E.; Dwija, I.B.N.P.; Budayanti, N.S.; Wirasandhi, G.A.K.; Subrata, K.; Susilarini, N.K.; Sudewi, R.A.A.; Wignall, F.S.; Mahardika, G.N.K. Epidemiological and Clinical Features of Human Rabies Cases in Bali 2008–2010. *BMC Infect. Dis.* **2012**, *12*, 81. <https://doi.org/10.1186/1471-2334-12-81>.
314. Mani, R.S.; Anand, A.M.; Madhusudana, S.N. Human Rabies in India: An Audit from a Rabies Diagnostic Laboratory. *Trop. Med. Int. Health* **2016**, *21*, 556–563. <https://doi.org/10.1111/tmi.12669>.
315. Damodar, T.; Mani, R.S.; Prathyusha, P.V. Utility of Rabies Neutralizing Antibody Detection in Cerebrospinal Fluid and Serum for Ante-Mortem Diagnosis of Human Rabies. *PLoS Negl. Trop. Dis.* **2019**, *13*, e0007128. <https://doi.org/10.1371/journal.pntd.0007128>.
316. Yokoyama, T.; Sugimoto, N.; Taniguchi, K.; Komoto, S.; Yuno, T.; Ohta, K.; Hashimoto, H.; Seno, A.; Ashida, A.; Fujieda, M.; et al. Molecular and Immunohistochemical Detection of Rotavirus in Urinary Sediment Cells of Children with Rotavirus Gastroenteritis. *Clin. Microbiol. Infect.* **2011**, *17*, 1190–1193. <https://doi.org/10.1111/j.1469-0691.2011.03522.x>.
317. Nakagomi, T.; Nakagomi, O. Rotavirus Antigenemia in Children with Encephalopathy Accompanied by Rotavirus Gastroenteritis. *Arch. Virol.* **2005**, *150*, 1927–1931. <https://doi.org/10.1007/s00705-005-0565-2>.
318. Ray, P.; Fenaux, M.; Sharma, S.; Malik, J.; Subodh, S.; Bhatnagar, S.; Greenberg, H.; Glass, R.I.; Gentsch, J.; Bhan, M.K. Quantitative Evaluation of Rotaviral Antigenemia in Children with Acute Rotaviral Diarrhea. *J. Infect. Dis.* **2006**, *194*, 588–593. <https://doi.org/10.1086/505878>.
319. Huang, X.L.; Chen, J.; Yu, Y.P.; Chen, L.Q.; Li, Z.Y.; Zhao, Z.Y. Viraemia and Extraintestinal Involvement after Rotavirus Infection. *Zhejiang Da Xue Xue Bao Yi Xue Ban* **2006**, *35*, 69–75. <https://doi.org/10.3785/j.issn.1008-9292.2006.01.013>.
320. Nishimura, S.; Ushijima, H.; Shiraishi, H.; Kanazawa, C.; Abe, T.; Kaneko, K.; Fukuyama, Y. Detection of Rotavirus in Cerebrospinal Fluid and Blood of Patients with Convulsions and Gastroenteritis by Means of the Reverse Transcription Polymerase Chain Reaction. *Brain Dev.* **1993**, *15*, 457–459. [https://doi.org/10.1016/0387-7604\(93\)90088-P](https://doi.org/10.1016/0387-7604(93)90088-P).
321. Chitambar, S.D.; Tatte, V.S.; Dhongde, R.; Kalrao, V. High Frequency of Rotavirus Viremia in Children with Acute Gastroenteritis: Discordance of Strains Detected in Stool and Sera. *J. Med. Virol.* **2008**, *80*, 2169–2176. <https://doi.org/10.1002/jmv.21338>.
322. Hemming, M.; Huhti, L.; Räsänen, S.; Salminen, M.; Vesikari, T. Rotavirus Antigenemia in Children Is Associated with More Severe Clinical Manifestations of Acute Gastroenteritis. *Pediatr. Infect. Dis. J.* **2014**, *33*, 366–371. <https://doi.org/10.1097/INF.0000000000000118>.
323. Justino, M.C.A.; Campos, E.A.; Mascarenhas, J.D.P.; Soares, L.S.; Guerra, S.D.F.S.; Furlaneto, I.P.; Pavão, M.J.C.; Maciel, T.S.; Farias, F.P.; Bezerra, O.M.; et al. Rotavirus Antigenemia as a Common Event among Children Hospitalised for Severe, Acute Gastroenteritis in Belém, Northern Brazil. *BMC Pediatr.* **2019**, *19*, 193. <https://doi.org/10.1186/s12887-019-1535-2>.
324. Satter, S.M.; Katz, E.; Hossain, M.E.; Fariha, F.; Talha, M.; Smart, S.L.; Bowen, M.D.; Rahman, M.; Parashar, U.D.; Cortese, M.M. Detection of Rotavirus in Respiratory Specimens From Bangladeshi Children Aged <2 Years Hospitalized for Acute Gastroenteritis. *J. Infect. Dis.* **2024**, *229*, 457–461. <https://doi.org/10.1093/infdis/jiad333>.
325. Lambert, A.J.; Kosoy, O.; Velez, J.O.; Russell, B.J.; Lanciotti, R.S. Detection of Colorado Tick Fever Viral RNA in Acute Human Serum Samples by a Quantitative Real-Time RT-PCR Assay. *J. Virol. Methods* **2007**, *140*, 43–48. <https://doi.org/10.1016/j.jviromet.2006.10.014>.
326. Duckmanton, L.; Luan, B.; Devenish, J.; Tellier, R.; Petric, M. Characterization of Torovirus from Human Fecal Specimens. *Virology* **1997**, *239*, 158–168. <https://doi.org/10.1006/viro.1997.8879>.

327. Martins, E.B.; Silva, M.F.B.; Tassinari, W.S.; de Bruycker-Nogueira, F.; Moraes, I.C.V.; Rodrigues, C.D.S.; Santos, C.C.; Sampaio, S.A.; Pina-Costa, A.; Fabri, A.A.; et al. Detection of Chikungunya Virus in Bodily Fluids: The INOVACHIK Cohort Study. *PLoS Negl. Trop. Dis.* **2022**, *16*, e0010242. <https://doi.org/10.1371/journal.pntd.0010242>.
328. de Almeida, P.N.G.; Alves, J.C.; Santos, C.N.O.; Magalhães, L.S.; da Cunha, W.S.; Macêdo, P.J.O.M.; dos Santos, C.A.; Litwinski, V.V.C.; Teixeira, M.M.; Altmann, D.M.; et al. Detection of Chikungunya Virus RNA in Cerebrospinal Fluid of Patients with Severe Neurological Disorders. *SN Compr. Clin. Med.* **2023**, *5*, 50. <https://doi.org/10.1007/s42399-023-01386-3>.
329. Sampaio, M.P.D.S.; do Rosário, M.S.; Martins, L.C.; Trindade, L.V.L.; Francisco, M.V.L.D.O.; Costa, B.G.G.; Vasconcelos, G.A.; Lima, I.A.B.; Macêdo, Y.S.F.; Carvalho, F.M.L.; et al. Detection of Encephalitis-Causing Viruses Reveals Predominance of Chikungunya Virus in the State of Bahia, Brazil. *Int. J. Infect. Dis.* **2024**, *145*, 107090. <https://doi.org/10.1016/j.ijid.2024.107090>.
330. Horling, J.; Vene, S.; Franzen, C.; Niklasson, B. Detection of Ockelbo Virus RNA in Skin Biopsies by Polymerase Chain Reaction. *J. Clin. Microbiol.* **1993**, *31*, 2004–2009. <https://doi.org/10.1128/jcm.31.8.2004-2009.1993>.
331. Kurkela, S.; Manni, T.; Myllynen, J.; Vaheri, A.; Vapalahti, O. Clinical and Laboratory Manifestations of Sindbis Virus Infection: Prospective Study, Finland, 2002–2003. *J. Infect. Dis.* **2005**, *191*, 1820–1829. <https://doi.org/10.1086/430007>.
332. Sane, J.; Kurkela, S.; Levanov, L.; Nikkari, S.; Vaheri, A.; Vapalahti, O. Development and Evaluation of a Real-Time RT-PCR Assay for Sindbis Virus Detection. *J. Virol. Methods* **2012**, *179*, 185–188. <https://doi.org/10.1016/j.jviromet.2011.10.021>.
333. Mohamed, N.; Magzoub, M.; Mohamed, R.E.H.; Aleanizy, F.S.; Alqahtani, F.Y.; Nour, B.Y.M.; Alkarsany, M.M.S. Prevalence and Identification of Arthropod-Transmitted Viruses in Kassala State, Eastern Sudan. *Libyan J. Med.* **2019**, *14*, 1564511. <https://doi.org/10.1080/19932820.2018.1564511>.
334. Nikiforova, M.A.; Kuznetsova, N.A.; Shchetinin, A.M.; Butenko, A.M.; Kozlova, A.A.; Larichev, V.P.; Vakalova, E.V.; Azarian, A.R.; Rubalsky, O.V.; Bashkina, O.A.; et al. Arboviruses in the Astrakhan Region of Russia for 2018 Season: The Development of Multiplex PCR Assays and Analysis of Mosquitoes, Ticks, and Human Blood Sera. *Infect. Genet. Evol.* **2021**, *88*, 104711. <https://doi.org/10.1016/j.meegid.2021.104711>.
335. Castellot, A.; Camacho, J.; Fernández-García, M.D.; Tarragó, D. Shotgun Metagenomics to Investigate Unknown Viral Etiologies of Pediatric Meningoencephalitis. *PLoS ONE* **2023**, *18*, e0296036. <https://doi.org/10.1371/journal.pone.0296036>.
336. Lowry, S.A.; Wolfe, M.K.; Boehm, A.B. Respiratory Virus Concentrations in Human Excretions That Contribute to Wastewater: A Systematic Review and Meta-Analysis. *J. Water Health* **2023**, *21*, 831–848. <https://doi.org/10.2166/WH.2023.057>.
337. Tembo, J.; Simulundu, E.; Changula, K.; Handley, D.; Gilbert, M.; Chilufya, M.; Asogun, D.; Ansumana, R.; Kapata, N.; Ntoumi, F.; et al. Recent Advances in the Development and Evaluation of Molecular Diagnostics for Ebola Virus Disease. *Expert Rev. Mol. Diagn.* **2019**, *19*, 325–340. <https://doi.org/10.1080/14737159.2019.1595592>; REQUESTEDJOURNAL:JOURNAL:IERO20;WGROU:STRING:PUBLICATION.
338. Garbuglia, A.R.; Lapa, D.; Pauciullo, S.; Raoul, H.; Pannetier, D. Nipah Virus: An Overview of the Current Status of Diagnostics and Their Role in Preparedness in Endemic Countries. *Viruses* **2023**, *15*, 2062. <https://doi.org/10.3390/v15102062>.
339. Klingelhöfer, D.; Braun, M.; Naser, C.A.; Brüggmann, D.; Groneberg, D.A. Emerging Nipah Virus with Pandemic Potential and High Mortality Rates: Is the Scientific Community Learning from Former Pandemics? *Rev. Med. Virol.* **2025**, *35*, e70028. <https://doi.org/10.1002/RMV.70028>.
340. Rodriguez, L.L.; De Roo, A.; Guimard, Y.; Trappier, S.G.; Sanchez, A.; Bressler, D.; Williams, A.J.; Rowe, A.K.; Bertolli, J.; Khan, A.S.; et al. Persistence and Genetic Stability of Ebola Virus during the Outbreak in Kikwit, Democratic Republic of the Congo, 1995. *J. Infect. Dis.* **1999**, *179*, S170–S176. <https://doi.org/10.1086/514291>.
341. Keita, A.K.; Vidal, N.; Toure, A.; Kalifa Diallo, M.S.; N’Fally, M.; Baize, S.; Mateo, M.; Raoul, H.; Mely, S.; Subtil, F.; et al. A 40-Month Follow-Up of Ebola Virus Disease Survivors in Guinea (PostEbogui) Reveals Long-Term Detection of Ebola Viral Ribonucleic Acid in Semen and Breast Milk. *Open Forum Infect. Dis.* **2019**, *6*, ofz482. <https://doi.org/10.1093/OFID/OFZ482>.
342. Worku, D.A. Tick-Borne Encephalitis (TBE): From Tick to Pathology. *J. Clin. Med.* **2023**, *12*, 6859. <https://doi.org/10.3390/JCM12216859>.
343. Taba, P.; Schmutzhard, E.; Forsberg, P.; Lutsar, I.; Ljøstad, U.; Mygland, Å.; Levchenko, I.; Strle, F.; Steiner, I. EAN Consensus Review on Prevention, Diagnosis and Management of Tick-Borne Encephalitis. *Eur. J. Neurol.* **2017**, *24*, 1214–e61. <https://doi.org/10.1111/ENE.13356>.
344. Branche, A.R.; Falsey, A.R. Parainfluenza Virus Infection. *Semin. Respir. Crit. Care Med.* **2016**, *37*, 538–554. <https://doi.org/10.1055/s-0036-1584798>.
345. Wang, X.; Li, Y.; Deloria-Knoll, M.; Madhi, S.A.; Cohen, C.; Arguelles, V.L.; Basnet, S.; Bassat, Q.; Brooks, W.A.; Echavarria, M.; et al. Global Burden of Acute Lower Respiratory Infection Associated with Human Parainfluenza Virus in Children Younger

- than 5 Years for 2018: A Systematic Review and Meta-Analysis. *Lancet Glob. Health* **2021**, *9*, e1077–e1087. [https://doi.org/10.1016/S2214-109X\(21\)00218-7](https://doi.org/10.1016/S2214-109X(21)00218-7).
346. Rafeek, R.A.M.; Divarathna, M.V.M.; Noordeen, F. A Review on Disease Burden and Epidemiology of Childhood Parainfluenza Virus Infections in Asian Countries. *Rev. Med. Virol.* **2021**, *31*, e2164. <https://doi.org/10.1002/RMV.2164>;PAGE-GROUP:STRING:PUBLICATION.
347. Lipkin, W.I.; Briese, T.; Hornig, M. Borna Disease Virus—Fact and Fantasy. *Virus Res.* **2011**, *162*, 162–172. <https://doi.org/10.1016/J.VIRUSRES.2011.09.036>.
348. Hornig, M.; Briese, T.; Licinio, J.; Khabbaz, R.F.; Altshuler, L.L.; Potkin, S.G.; Schwemmler, M.; Siemietzki, U.; Mintz, J.; Honkavuri, K.; et al. Absence of Evidence for Bornavirus Infection in Schizophrenia, Bipolar Disorder and Major Depressive Disorder. *Mol. Psychiatry* **2012**, *17*, 486–493. <https://doi.org/10.1038/MP.2011.179>.
349. Chen, S.J.; Rai, C.I.; Wang, S.C.; Chen, Y.C. Infection and Prevention of Rabies Viruses. *Microorganisms* **2025**, *13*, 380. <https://doi.org/10.3390/MICROORGANISMS13020380>.
350. Kim, A.E.; Brandstetter, E.; Wilcox, N.; Heimonen, J.; Graham, C.; Han, P.D.; Starita, L.M.; McCulloch, D.J.; Casto, A.M.; Nickerson, D.A.; et al. Evaluating Specimen Quality and Results from a Community-Wide, Home-Based Respiratory Surveillance Study. *J. Clin. Microbiol.* **2021**, *59*, e02934–20. <https://doi.org/10.1128/JCM.02934-20>.
351. Nakamura, S.; Yang, C.S.; Sakon, N.; Ueda, M.; Tougan, T.; Yamashita, A.; Goto, N.; Takahashi, K.; Yasunaga, T.; Ikuta, K.; et al. Direct Metagenomic Detection of Viral Pathogens in Nasal and Fecal Specimens Using an Unbiased High-Throughput Sequencing Approach. *PLoS ONE* **2009**, *4*, e4219. <https://doi.org/10.1371/JOURNAL.PONE.0004219>.
352. Chan, P.; Spudich, S. HIV Compartmentalization in the CNS and Its Impact in Treatment Outcomes and Cure Strategies. *Curr. HIV/AIDS Rep.* **2022**, *19*, 207–216. <https://doi.org/10.1007/s11904-022-00605-1>.
353. Edén, A.; Fuchs, D.; Hagberg, L.; Nilsson, S.; Spudich, S.; Svennerholm, B.; Price, R.W.; Gisslén, M. HIV-1 Viral Escape in Cerebrospinal Fluid of Subjects on Suppressive Antiretroviral Treatment. *J. Infect. Dis.* **2010**, *202*, 1819–1825. <https://doi.org/10.1086/657342>.
354. Berger, A.; Groh, A.M.; Diaz, D.; Canchola, J.A.; Toptan, T.; Ciesek, S.; Jarem, D.; Kuchta, A.L.; Moonsamy, P.; Vehreschild, M.J.G.T. Temporal Dynamics of SARS-CoV-2 Detection in Household Contacts: Divergences Between Time to First Positive Test, Symptom Onset, and Maximum Viral Load. *Infect. Dis. Ther.* **2025**, *14*, 2605–2617. <https://doi.org/10.1007/S40121-025-01235-X>.

**Disclaimer/Publisher’s Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.