Table 1: Characteristics of infants at moment of ARTI episode.(Online only)

|  |  |  |  |
| --- | --- | --- | --- |
| Reference testa |  | RSV positive | RSV negative |
|  | Total ARTI episodesn=162 | BinaxNOW® positive(TP)n=5 | BinaxNOW® negative(FN)n=61 | BinaxNOW®negative(TN)n=96 |
| Age at moment of ARTI episode, days (median [IQR]) | 84 [39-178] | 42 [33-203] | 99 [49-197] | 67 [34-161] |
| Sex, male (n (%))b | 94 (58.0%) | 4 (80.0%) | 33 (54.1%) | 57 (59.4%) |
| Comorbidity, (n (%))c | 4 (2.5%) | 1 (20.0%) | 3 (4.9%) | 0 (0%) |
| Duration of symptomsddays (median, [IQR]) | 3 [2-5] | 4 [2-5] | 3 [2-4] | 3 [2-6] |
| Level of care needed (n, (%))e Non MA-ARTI MA-ARTI Hospitalised PICU | 41 (25.3%)83 (51.2%)36 (22.2%) 11 (30.6%) | 0 (0.0%)3 (60.0%)2 (40.0%) 2 (100%) | 5 (8.2%)28 (45.9%)28 (45.9%) 7 (25.0%) | 36 (37.5%)52 (54.2%)6 (6.3%) 2 (33.3%) |
| Country (n, (%)) Netherlands United Kingdom Spain | 118 (72.8%)14 (8.6%)30 (18.5%) | 3 (60.0%)0 (0.0%)2 (40.0%) | 53 (86.9%)0 (0.0%)8 (13.1%) | 62 (64.6%)14 (14.9%)20 (20.8%) |
| ReSViNET scoref(median [IQR]) | 3 [1-6] | 6 [5-16] | 5 [3-9] | 1 [1-3] |
| Reference test (n, (%)) Alere i RSV  Xpert Xpress Flu/RSV | 120 (74.1%)42 (25.9%) | 5 (100.0%)0 (0.0%) | 32 (52.5%)29 (47.5%) | 83 (86.5%)13 (13.5%) |

Categorical data are expressed as frequency (%) and continuous data are expressed as median [interquartile range]. Percentages may not equal 100, because of rounding and missing values. P-values were not determined because of the low number of positive test results with BinaxNOW RSV.

Abbreviations: ARTI, acute respiratory tract infection; n, number of ARTI episodes; FN, false negative; MA-ARTI medically attended acute respiratory tract infection; PICU, pediatric intensive care unit; TN, true negative; TP, true positive;
aAlere i RSV or Xpert Xpress Flu/RSV were used as reference test.

b Including ten males which were tested twice

c None of the infants with comorbidity were tested twice

d Data available for 125 episodes

e Data available for 160 episodes

f Data available for 99 episodes

Table 2: Primary analysis of BinaxNOW® RSV performance.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Sensitivity (%) | Specificity (%) | PPV (%) | NPV (%) |
| Primary analysis (n=162)*95% CI (%)* | 7.6 (5/66)*3.3-16.5* | 100 (96/96)*96.2-100.0* | 100 (5/5)*56.6-100.0* | 61.1 (96/157)*54.3-68.4* |

Data are percentages (proportions) of BinaxNOW RSV test results compared to the reference test.

Abbreviations: ; PPV, positive predictive value; NPV, negative predictive value; n, number of ARTI episodes; 95% CI, 95% confidence interval

Table 3: BinaxNOW RSV performance by different variables. (online only)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Sensitivity (%) | Specificity (%) | PPV (%) | NPV (%) |
| Level of care neededa Non-MA ARTI (n=41) MA ARTI (n=83) Hospitalised (n=36) PICU (n=11)*P value* | 0 (0/5)9.7 (3/31)6.7 (2/30)  22.2 (2/9)*0.726* | 100 (36/36)100 (52/52)100 (6/6)  100 (2/2)*NA* | NA (0/0)100 (3/3)100 (2/2)  100 (2/2)*NA* | 87.8 (36/41)65.0 (52/80)17.6 (6/34) 22.2 (2/9)*<0.005* |
| Age <= 60 days (n=68) > 60 days (n=93)*P value* | 12.5 (3/24)4.8 (2/42)*0.345* | 100 (44/44)100 (51/51)*NA* | 100 (3/3)100 (2/2)*NA* | 67.7 (44/65)56.0 (51/91)*0.183* |
| Duration of symptoms before testingb <= 5 days (n=98) > 5 days (n=26)*P value* | 9.8 (5/51)0 (0/8)*>0.999* | 100 (47/47)100 (18/18)*NA* | 100 (5/5)NA (0/0)*NA* | 50.5 (47/93)69.2 (18/26)*0.119* |
| ReSViNET scorec <= 3 (n=53) > 3 (n=46)*P value* | 0 (0/17)12.8 (5/39)*0.309* | 100 (36/36)100 (7/7)*NA* | NA (0/0)100 (5/5)*NA* | 67.9 (36/53)17.1 (7/41)*<0.005* |

Data are percentages (proportions) of BinaxNOW RSV performance test results compared to the reference test. ReSViNET score was used to evaluate disease severity (Suppl fig 1)

Abbreviations: ARTI, acute respiratory tract infection; MA-ARTI medically attended acute respiratory tract infection; NPV, negative predictive value; PICU, pediatric intensive care unit; PPV, positive predictive value; n, number of ARTI episodes

a Data available for 160 episodes

b Data available for 125 episodes

c Data available for 99 episodes

Table 4: Overview of characteristics of published studies about the performance of BN compared to molecular tests in children. (online only)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Study | Age  | Type of ARTI | Reference test | Type of sample | POC setting |  n= | Sensitivity (95% CI) | Specificity (95% CI) |
| Present study | <1 year (median, 84 days) | Hospitalised, (non)-MA ARTI | Alere i,Xpert Xpress | NS (flocked swabs in 3 ml UTM/M4RT | Yes | 162 | 7.6% (3.3 – 16.5) | 100% (96.2-100) |
| Bruning et al., 2014[18] | <16 years | Hospitalised, (PICU), respiratory illness | RT-PCR | NPS, NPW | No | 66 | 80% (64.3-95.7) | 100% (NA) |
| Jung et al.,2016[19] | <2 years | Hospitalised, ALRI | RT-PCR | NPS in 1.5 ml VTM (in-house) | No | 91 | 71.4% (61.4-79.7) | NA |
| Khanom et al., 2011[11] | <5 years | Hospitalised, ARTI | RT-PCR | NPS in 1 ml VTM (in-house) | Yes | 159 | 41.2% (27.9-55.8) | 100% (95.7-100) |
| Miernyk et al., 2010[7] | <3 years (mean 9.3 months) | Hospitalised, LRTI | RT-PCR | NPW | No | 311 | 72%(61-74) | 97% (94-99) |
| Mills et al., 2011[12] | <2 years (mean 7 months) | ED, respiratory symptoms | RT-PCR | NPA, NPW | Yes | 579 | 83% (79-87) | 83% (78-87) |
| Papenburg et al., 2013[20] | <3 years (median 5.7 months) | Hospitalised, ARTI | RT-PCR | NPA | No | 720 | 80% (76-83.5) | 96.9% (94-98.6) |
| Pfeil et al., 2014[21] | <3 years (mean 7.9 months) | Hospitalised, ARTI | RT-PCR | NW | Yes | 242 | 63% (61-76) | 100% (NA) |

*Abbreviations: ARTI, acute respiratory tract infection; ED, emergency department; LRTI, lower respiratory tract infection; MA-ARTI medically attended acute respiratory tract infection; NS, nasal swab; NPA, nasopharyngeal aspirate; NPS, nasopharyngeal swab; NPW, nasopharyngeal wash; NW, nasal wash; NPV, negative predictive value; PICU, paediatric intensive care unit; POC, point-of-care; RT-PCR; reverse transcription polymerase chain reaction.*

Figure 1: Study flow chart showing eligible ARTI episodes and test results of samples which were tested by BinaxNOW® RSV and the reference test.

Abbreviations: ARTI, acute respiratory tract infection; n, number of ARTI episodes; BN, BinaxNOW® RSV; RSV, respiratory syncytial virus



Supplementary Table 1: ReSViNET score: Each clinical symptom is scored according to the description provided. The total score forms the ReSViNET score (0-20).[15]