Supplementary tables

Table 1: Characteristics of Studies evaluating incidence of RSV infection in general population

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Country** | **Study Period** | **Study population** | **Study design** | **Setting** | **Outcomes** | **Diagnostic method** | **Reference** |
| Egypt | 2009-2012 | All ages | Population-Based Surveillance | Hospital  Outpatient | ARI ILI | RT-PCR | Rowlinson et al. 2013 [1] |
| Kenya | 2007-2011 | All ages | Population-based surveillance | Outpatient | SARI  ILI | RT-PCR | Bigogo et al. 2013 [2] |
| Kenya | 2009-2012 | All ages | Population-based surveillance | Inpatient Outpatient | SARI ILI | RT-PCR | Emukule et al. 2014 [3] |
| Kenya | 2007-2010 | All ages | Population-based surveillance | Inpatient Outpatient | ARI | RT-PCR | Feikin et al. 2012 [4] |
| Thailand | 2008-2011 | All ages | Population based Surveillance | Hospital | ALRI | RT-PCR | Naorat et al. 2013 [5] |
| USA | 2006-2010 | ≥50 years | Prospective communityhort | Main and Satellite clinics, ED | ARI | Multiplex RT-PCR | McClure et al. 2014 [6] |

ALRI=acute lower respiratory infection; ARI=acute respiratory infection; ED=emergency department; ILI=influenza-like illness; qRT-PCR=quantitative reverse transcription polymerase chain reaction; RT-PCR=reverse transcription polymerase chain reaction; SARI=severe acute respiratory infection

Table 2: Characteristics of studies evaluating the proportion of RSV among respiratory infection in general population

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Country** | **Period** | **Population** | **Design** | **Setting** | **Outcomes** | **Diagnostic method** | **Reference** |
| **Africa** | | | | | | | |
| Egypt | 2009-2012 | All ages | Population-Based Surveillance | Hospital  Outpatient | ARI ILI | RT-PCR | Rowlinson et al. 2013 [1] |
| Kenya | 2007-2011 | All ages | Population-Based Surveillance | Outpatient | SARI  ILI | RT-PCR | Bigogo et al. 2003 [2] |
| Kenya | 2009-2012 | All ages | Population-based surveillance | Inpatient Outpatient | SARI ILI | RT-PCR | Emukule et al. 2014 [3] |
| Kenya | 2007-2010 | All ages | Population-based surveillance | Inpatient Outpatient | ARI | RT-PCR | Feikin et al. 2012 [4] |
| Senegal | 2009-2011 | >50 years | Prospective Descriptive  (Influenza sentinel) | Outpatient | ILI | RT-PCR | Dia et al. 2014 [7] |
| Cameroon | 2009 | All ages | Population based Surveillance  (Influenza sentinel) | Outpatient | ILI | Multiplex RT-PCR | Njouom et al. 2012 [8] |
| Gabon | 2010-2011 | All ages | Population based Surveillance | Health care center, hospital | ILI | Multiplex RT-PCR | Lekana-Douki et al. 2014 [9] |
| South Africa | 1982-1991 | All ages | Active surveillance | Outpatient | ARI | Cell Culture | McAnerney et al. 1994 [10] |
| Latin America | | | | | | | |
| Venezuela | 2006-2010 | All ages | Prospective Surveillance | Outpatient | ILI | RT-PCR | Comach et al. 2012 [11] |
| El Salvador Honduras Nicaragua | 2006-2009 | All ages | Prospective Descriptive | Hospital | ILI | RT-PCR | Laguna-Torres et al. [12] |
| 15 countries | 2008-2009 | ≥65 years | Active surveillance  (Influenza65 trial cohort) | Community / Retirement home | ILI | Multiplex RT-PCR | Falsey et al. 2014 [13] |
| Argentina | 2004 2005 | All ages | Prospective descriptive | Outpatient | ILI | Immunofluorescence | Santamaria et al. 2008 [14] |
| Colombia | 2000-2011 | All ages | Retrospective descriptive | Local health centers, Hospital | ARI | RT-PCR | Barbosa Ramirez et al. 2014 [15] |
| 24 Carribean countries | 2010-2011 | All ages | Surveillance (Caribbean Epidemiology Centre) | Laboratory network | ARI | RT-PCR | Edwards et al. 2013 [16] |
| Guatemala | 2007-2011 | All ages | Surveillance | Hospital | ARI | RT-PCR | Verani et al. 2013 [17] |
| Asia | | | | | | | |
| China | 2010 | All ages | Prospective descriptive | Outpatient | ILI | RT-PCR | Li et al. 2010 [18] |
| China | 2011-2013 | All ages | Prospective descriptive | Hospital | ILI | RT-PCR | Ju et al. 2014 [19] |
| China | 2010-2011 | ≥14 years | Prospective descriptive | ED | ARI | Multiplex RT-PCR | Yu et al. 2012 [20] |
| China | 2005-2007 | ≥14 years | Prospective descriptive | Outpatient | ARI | Multiplex nested RT-PCR | Ren et al. 2009 [21] |
| Nepal | 2011-2014 | Pregnant women | Prospective home-based surveillance | Household | Respiratory illness | RT-PCR | Chu et al. 2016[22] |
| China | 2010-2011 | All ages | Active surveillance | Outpatient | ILI | RT-PCR | Huo et al. 2012 [23] |
| Korea | 2005-2008 | Adults | Retrospective descriptive | Hospital | ARI | Culture | Seo et al. 2014 [24] |
| India | 2011-2012 | All ages | Prospective descriptive | Inpatient Outpatient | ILI, ARI | RT-PCR | Chavan et al. 2015 [25] |
| China | 2005-2010 | ≥15 years | Prospective descriptive | Fever clinic | ARI | Multiplex RT-PCR | Xiang et al. 2013 [26] |
| China | 2009-2013 | All ages | Active surveillance | Sentinel hospitals | ALRI | RT-PCR | Feng et al. 2014 [27] |
| Israel | 1997 | ≥21 years | Prospective descriptive | GP clinic | ARI | EIA | Lieberman et al. 1998 [28] |
| Thailand | 2006-2008 | Adults | Prospective descriptive | Hospital | CAP | Nested RT-PCR | Hara et al. 2011 [29] |
| China | 2009-2010 | ≥14 years | Prospective descriptive | Hospital | ARTI | Multiplex nested RT-PCR | Lu et al. 2013 [30] |
| Thailand | 2008-2011 | All ages | Population based Surveillance | Hospital | ALRI | RT-PCR | Naorat et al. 2013 [5] |
| South Korea | 2010-2012 | Adults | Prospective cohort | Hospital (ICU) | HAP | Multiplex RT-PCR | Hong et al. 2014 [31] |
| Thailand | 2003-2005 | All ages | Active surveillance of pneumonia | Hospital | Pneumonia | RT–PCR | Olsen et al. 2010 [32] |
| India | 2011-2013 | ≥5 years | Prospective descriptive | Hospital | SARI | RT-PCR | Jain et al. 2014 [33] |
| Philippines | 2010-2013 | All ages | Surveillance | Sentinel hospital | ILI | Multiplex RT-PCR | Otomaru et al. 2015 [34] |
| China | 2009-2014 | All ages | Surveillance | Hospital | RTI | RT-PCR | Liao et al. 2015 [35] |
| Taiwan | 2008-2009 | ≥65 years | Active surveillance  (Influenza65 trial cohort) | Community / Retirement home | ILI | Multiplex RT-PCR | Falsey et al. 2014 [13] |
| Kuwait | 3 year study | All ages | Prospective descriptive | Hospital | ARI | PCR | Khadadah et al. 2010 [36] |
| Israel | 2007-2012 | All ages | Descriptive | Hospital | ILI | RT-PCR | Meningher et al. 2014 [37] |
| Lao PDR | 2009-2010 | All ages | Prospective descriptive | Hospital | ALRI | RT-PCR | Sentilhes et al. 2013 [38] |
| Papua New Guinea | 2010 | All ages | Retrospective descriptive | Hospital | ILI | RT-PCR | Kono et al. 2014 [39] |
| China | 2010-2012 | ≥14 years | Prospective descriptive | Hospital | CAP | RT-PCR | Qu et al. 2015 [40] |
| Europe | | | | | | | |
| UK | 2000-2001 | ≥16 years | Active Surveillance | Military Centre | ILI | RT-PCR | O’Shea et al. 2007 [41] |
| Italy | 2004-2005 | All ages | Prospective descriptive | GP clinics | ILI | Multiplex RT-PCR | Rezza et al. 2006 [42] |
| Spain | 2003-2004 | ≥14 years | Prospective descriptive | Hospital | CAP | Multiplex RT-PCR | Angeles et al. 2006 [43] |
| UK | 1999-2000 | All ages | Prospective descriptive | GP clinics | ILI | Multiplex RT-PCR | Wallace et al. 2004 [44] |
| UK | 1995-1998 | All ages | Prospective descriptive | Sentinel GP clinics | ILI | Multiplex RT-PCR | Zambon et al. 2001 [45] |
| UK | 1992­-1994 | ≥60 years | Community survey | Community volunteers | URTI | Complement Fixation | Nicholson et al. 1997 [46] |
| France | 1994-1995 | All ages | Prospective descriptive | GP clinics | ILI | Immunostaining; Cell Culture | Lina et al. 1996 [47] |
| France | 2012-2015 | All ages | Retrospective cohort  (FLUVAC effectiveness study) | Hospital | ILI | RT-PCR | Loubet et al. 2017 [48] |
| Sweden | 1971-1980 | ≥16 years | Retrospective descriptive | Hospital | Pneumonia | Indirect IFA | Vikerfors et al. 1987 [49] |
| Turkey | 2003-2005 | >17 years | Descriptive | Outpatient | CAP | Direct IFA | Koksal et al. 2010 [50] |
| UK | 2009-2010 | All ages | Prospective descriptive | Hospital  GP clinics | ARI | Multiplex RT-PCR | Tanner et al 2012 [51] |
| UK | 1981-1982 | >50 years | Prospective descriptive | Hospital (Geriatric wards) | ARI | Fluorescent antibody technique | Morales et al. 1983 [52] |
| UK | 1974-1980 | >12 years | Descriptive | Hospital | Pneumonia | Complement fixation | White et al. 1981 [53] |
| 8 European countries | 2008-2009 | ≥65 years | Active surveillance  (Influenza65 trial cohort) | Community / Retirement home | ILI | Multiplex RT-PCR | Falsey et al. 2014 [13] |
| US and Canada | | | | | | | |
| USA | 2011-2012 | All ages | Prospective descriptive (EPIC study) | Outpatient | CAP | RT-PCR | Self et al. 2016 [54] |
| USA | 2000-2001 | ≥16 years | Active surveillance ASurveillance | Military Centre | ARI | RT-PCR, culture | O’Shea et al. 2005 [55] |
| USA | 2010-2014 | All ages | Active surveillance | Hospital | SARI | Multiplex PCR | Wansaula et al. 2016 [56] |
| USA | 2009-2010 | ≥18 years | Retrospective descriptive | Hospital | RVI | xTAG respiratory viral panel | Walker et al. 2014 [57] |
| USA | 1990-1992 | ≥18 years | Prospective cohort | Hospital | CAP | Indirect EIA | Dowell et al. 1996 [58] |
| USA | 2009-2010 | ≥18 years | Retrospective descriptive (Influenza effectiveness study) | Hospital  ED | ARI | RT-PCR | Widmer et al. 2014 [59] |
| USA | 1989-1992 | ≥65 years | (Influenza surveillance) | Hospital | ILI  Acute cardiopulmonary condition | Culture EIA | Falsey et al. 1995 [60] |
| USA | 2002 | ≥18 years | Prospective descriptive | ED | ARI | RT-PCR | Louie et al. 2005 [61] |
| USA | 2012 | All ages | Prospective descriptive (Influenza effectiveness study) | Outpatient | MA-ARI | Multiplex RT-PCR | Zimmerman et al. 2014 [62] |
| USA | 1975-1995 | 18-60 years | Surveillance | Hospital | RVI | Culture | Hall et al. 2001 [63] |
| USA | 1999-2003 | ≥65 years | Prospective cohorts | Community Hospital | ARI | RT-PCR | Falsey et al. 2005 [64] |
| USA | 2004-2010 | ≥50 years | Prospective descriptive | Inpatient  Outpatient | MA-ARI | Multiplex RT-PCR | Sundaram et al. 2014 [65] |
| USA | 2006-2010 | ≥50 years | Prospective community cohort | Main clinic  Satellite clinic  Emergency department | MA-ARI | Multiplex RT-PCR | McClure et al. 2014 [6] |
| USA | 2006-2009 | ≥50 years | Prospective  (Influenza VE study) | Hospital | ARI | RT-PCR | Widmer et al. 2012 [66] |
| Canada | 2004-2006 | Adults | Prospective descriptive | Hospital | CAP | DFA Testing | Johnstone et al. 2008 [67] |

Table 3: Stratified analysis for the proportion of RSV associated ARI in Asia

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | Summary estimate | Lower 95% CI | Upper 95% CI | I2 | Number of estimates | Inter-group heterogeneity (p-value<0.05) |
| *Age Group* |  |  |  |  |  | 0.0000 | |
| <50 years | 0.01 | 0.00 | 0.02 | 92.69 | 10 |  | |
| >=50 years | 0.02 | 0.01 | 0.03 | 90.93 | 7 |  | |
| All Ages | 0.10 | 0.07 | 0.15 | 99.16 | 19 |  | |
| All Adults | 0.01 | 0 | 0.02 | 82.36 | 16 |  | |
| ***Study Period*** |  |  |  |  |  | 0.4337 | |
| Before 2000 | - | - | - | - | - |  | |
| 2000-2010 | 0.04 | 0.02 | 0.06 | 98.69 | 30 |  | |
| Post 2010 | 0.04 | 0.02 | 0.07 | 99.09 | 21 |  | |
| ***Illness Definition*** |  |  |  |  |  | 0.0000 | |
| SARI | \* | \* | \* | \* |  |  | |
| CAP | 0.03 | 0.02 | 0.04 | 23.14 | 6 |  | |
| ILI | 0.04 | 0.02 | 0.07 | 94.99 | 13 |  | |
| ARI | 0.02 | 0 | 0.03 | 99.10 | 20 |  | |
| Miscellaneous | 0.09 | 0.03 | 0.16 | 99.48 | 11 |  | |
| ***Diagnostic Method*** |  |  |  |  |  | 0.0150 | |
| Multiplex PCR | 0.04 | 0.02 | 0.07 | 97.98 | 15 |  | |
| Other PCR | 0.05 | 0.03 | 0.07 | 99.35 | 28 |  | |
| DFA/IIF/ELIZA/EIA | - | - | - | - | - |  | |
| Culture | \* | \* | \* | \* | \* |  | |
| Other | \* | \* | \* | \* | \* |  | |
| Mixed | \* | \* | \* | \* | \* |  | |

Note: '-' not calculated by program, low number of estimates in the group, no variation considered between the variables as all estimates from the same study; ‘\*’ estimates not provided all the estimates in the group from same study

Table 4: Meta-regression results for Asia

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | **Coefficient** | **Standard error** | **p-value** |
| *Age Group* | 0.010 | 0.010 | 0.302 |
| *Study Period* | 0.018 | 0.021 | 0.405 |
| *Illness Definition* | 0.014 | 0.011 | 0.210 |
| *Diagnostic Method* | -0.005 | 0.009 | 0.550 |

Table 5: Meta-regression results for the United States and Canada

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Coefficient | Standard error | p-value |
| Age Group | -0.023 | 0.010 | 0.030 |
| Study Period | -0.016 | 0.022 | 0.480 |
| Illness Definition | 0.013 | 0.009 | 0.152 |
| Diagnostic Method | -0.005 | 0.063 | 0.094 |

Table 6: Study characteristics for proportion of RSV in population with underlying conditions or diseases

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Country** | **Study Period** | **Population** | **Design** | **Setting** | **Outcomes** | **Diagnostic method** | **Reference** |
| Australia | 1993-1994 | Adults ; Asthma | Case control | Hospital | AE-asthma | Serology / culture | Teichtahl et al. 1997 [68] |
| Australia | 2003-2005 | >50 years; COPD | Prospective cohort | Hospital | AE-COPD | Multiplex PCR | Hutchinson te al. 2007 [69] |
| Australia | 2009-2012 | Multiple myeloma | Retrospective cohort | Cancer center | VRI | multiplex PCR | Teh et al. 2015 [70] |
| Canada | 2007-2008 | COPD | Prospective cohort | Hospital  ED | AE-COPD | RT-PCR | Kherad et al. 2010 [71] |
| Canada (Quebec) | 2002-2003 | >50 years of age, COPD | Prospective cohort | Hospital | AE-COPD | RT-PCR | De Serres et al. 2009 [72] |
| Europe | 1997-1998 | HSCT | Prospective cohort | BMT centers | ARI | Not described | Ljungman et al. 2001 [73] |
| France | 2002-2004 | Chronic cardiac or pulmonary disorder | Descriptive | CCU | Acute respiratory or cardiac failure | RT-PCR | Carrat et al. 2006 [74] |
| Greece | 2008-2009 | ≥18 years ; confirmed COPD | Prospective descriptive | Hospital | AE-COPD | RT-PCR | Dimopoulos et al. 2012[75] |
| Hong Kong | 2004-2005 | COPD | Prospective cohort | Hospital | AE-COPD | Culture, multiplex PCR | Ko et al. 2007[76] |
| Iran | 2010-2012 | Adults, COPD | Case-control | Hospital | AE-COPD | PCR | Hosseini et al. 2015[77] |
| Kenya | 2007-2010 | HIV + | Surveillance | Inpatient  Outpatient | ARI | RT-PCR | Feikin et al. 2012 [4] |
| Spain | 1999-2003 | Adult, HSCT | Prospective cohort | Hospital | ARI | RT-PCR | Martino et al. 2005 [78] |
| Sweden | 2000-2007 | Allogenic HSCT | Retrospective chart review | Hospital | ARI | Not described | Avetisyan et al. 2009 [79] |
| Sweden | NA | Cardiovascular disease, Chronic lung disease,  Chronic alcoholism, Diabetes mellitus, Malignancy, Splenectomy, Rheumatoid arthritis, Drug abuse, Ankylosing spondylitis, SLE | Descriptive | Hospital | CAP | Indirect IFA | Berntsson et al. 1985 [80] |
| UK | 1981-1982 | Elderly, geriatric long stay patients | Prospective descriptive | Geriatric wards | ARI | Culture | Morales et al. 1983 [52] |
| UK | 1990-1992 | Adults, Asthma | Prospective descriptive | Hospital | AE-asthma | Serology / culture | Nicholson et al. 1993 [81] |
| UK | NA | COPD | Prosepctive cohort | Outpatient clincic | AE-COPD | PCR | Seemungal et al. 2001 [82] |
| USA | 1989-1990 | ≥65 years, institutionnalized patients | Prospective descriptive | Home for elderly | ARI | Culture | Falsey et al. 1992 [83] |
| USA | 1992-1993 | Elderly, senior daycare center | Prospective descriptive | Senior day care center | ARI | Culture | Falsey et al. 1995 [84] |
| USA | 1992-1994 | Adults, BMT | Prospective descriptive | Cancer center | ARI | Culture | Whimbey et al. 1996 [85] |
| USA | 1993-1994 | Leucemia | Prospective descriptive | Cancer center | ARI | Culture  Indirect IFA | Whimbey et al. 1995 [86] |
| USA | 1992-1997 | Adult, lung transplant | Retrospective cohort | Cancer center | RVI | Not described | Palmer et al. 1998 [87] |
| USA | 1994-1999 | Adult, allogenic HSCT | Retrospective descriptive | Cancer center | RSV infection | DFA / Pack EIA | Small et al. 2002 [88] |
| USA | 1996-1998 | COPD or CHF | Prospective cohort | dwelleing community | ARI | Culture  EIA | Walsh et al. 1999 [89] |
| USA | 1997-1998 | Cancer patients receiving cytotoxic chemotherapy with or without BMT | Prospective cohort | Hospital | RSV infection | IFA / culture | Anaissie et al. 2004 [90] |
| USA | 1993-2006 | Pediatric HSCT, SOT and chemotherapy | Retrospective cohort | Hospital | RVI | DFA / PCR / Culture | Lo t al. 2013 [91] |
| USA | 1999-2003 | ≥65 years, cardiopulmonary disease | Prospective cohort | Hospital | ARI | RT-PCR | Falsey et al. 2005 [92] |
| USA | 2000-2004 | Adults, HSCT | Prospective descriptive | Hospital | RVI | RT-PCR | Peck et al. 2007 [93] |
| USA | 2004-2010 | Adults; COPD/ liver/renal diseasaes, CHF | Prospective | Inpatient  Outpatient | ARI | PCR | Sundaram et al. 2014 [65] |
| USA | 2002 | Multiple diseases (Allergy, COPD, Heart disease, Liver disease, Diabetes, Cancer, Asthma) | Prospective, descriptive | ED | ARI | PCR  Culture | Louie et al. 2005 [61] |
| USA | 2002-2003 | COPD | Prospective descriptive | Hospital | AE-COPD | RT-PCR | Martinello et al. 5006 [94] |
| USA | 2003-2004 | COPD | Prospective  cohort | ED | AE-COPD | PCR | Camargo et al. 2008 [95] |
| USA | 2009-2010 | Multiple diseases (Lung disease, Liver disease, Renal disease, Diabetes, Cardiovascular disease, Immunocompromised (any cause)) | Retrospective chart review | Hospital | RVI | RVP ProFlu+ | Walker et al. 2014 [57] |
| USA | 2009-2010 | Adults, Lives alone, Lives with family In nursing facility, Chronic illnesses, Cardiovascular disease, Pulmonary disease, Diabetes, Immunodeficiency , Exposure to tobacco smoke | Retrospective descriptive (Influenza effectiveness study) | Hospital  ED | ARI | RT-PCR | Widmer et al. 2014 [59] |
| USA | 2010-2014 | Hypertension, Metabolic disorder, Chronic lung disease, Cardiac disease, Current smoker, Immunosuppression, Morbid obesity  Neuromuscular disease | Active surveillance | Hospital | SARI | Multiplex PCR | Wansaula et al. 2016 [56] |

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