**Appendix S1**. Equations used in calculation of annual number of cases of influenza-associated severe acute respiratory infection (SARI) cases.

**Equation 1: Incidence rate of hospitalized SARI in base province**

Where:

 = Base rate of hospitalized SARI

 = Number of total cases meeting SARI case definition hospitalized in base province per year

 = Population of surveillance catchment area

**Equation 2a: Calculation of adjustment for risk factors at the provincial level for base rate hospitalized SARI**

Where:

 = Adjustment factor for province Y for risk factors of SARI

 = Prevalence of risk factor *i* in province Y

 = Prevalence of risk factor *i* in base province

 = Relative risk of SARI due to risk factor *i*

**Equation 2b: Rate of hospitalized SARI in province after adjustment for risk factors and healthcare-seeking behavior**

Where:

 = Incidence of hospitalized SARI in province Y

 = Proportion of ARI cases seeking care in province Y (from DHS)

 = Proportion of ARI cases seeking care in base province (from DHS)

**Equation 3: Rate of influenza-associated hospitalized SARI in province**

Where:

 = Incidence of hospitalized influenza-associated SARI in province Y

 = Proportion of pneumonia due to influenza

**Equation 4: Rate of influenza-associated non-hospitalized SARI in province**

Where:

= Incidence of non-hospitalized influenza-associated SARI in province Y

 = Proportion of all SARI cases that are hospitalized in province Y

Where:

 = Proportion of all SARI cases that are hospitalized in the base province

**Equation 5: Number of influenza-associated hospitalized and non-hospitalized SARI cases in province**

Where:

 = Number of hospitalized influenza-associated SARI cases in province Y

= Number of non-hospitalized influenza-associated SARI cases in province Y

 = Population in province Y