*Run the model given the instructions in Session5\_Exercise\_RSV.R – run the model for 10 years with 3 million susceptible, 3 asymptomatic infectious, and 1 symptomatic infectious.*

1. Calculate the peak magnitude, timing of peak, and cumulative incidence (code provided in script).
   1. How many peaks are there?
   2. Comment on the cumulative incidence – is it what you expect?
   3. Copy the incidence plot below
2. What do we know about RSV transmission patterns and how does that differ from the output of the model as it stands?

*In order incorporate seasonality, let’s add a cosine function to our beta and gamma calculations within the seair\_ode() function:*

*beta\_t = beta \* (1 + beta1 \* cos(2 \* pi \* times / 365))*

*gamma\_t = gamma \* (1 + gamma1 \* cos(2 \* pi \* times / 365))*

*And make sure to include the following in parms:*

*beta1 = 0.3396*

*gamma1 = 0.3396*

*Reference:* [*https://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-024-09400-2*](https://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-024-09400-2)

1. Next, describe how this changes the output curve – does this better align with what we understand about RSV epidemiology?
   1. Calculate the peak magnitude, timing of peak, and cumulative incidence.
   2. How many peaks are there?
   3. Copy the incidence plot below
2. Compare and comment on the cumulative incidence in (1) to that which you calculated in (3).
3. Compare and comment on the incidence plots from (1) and (3).