Seasonal influenza

Country X currently funds an annual influenza vaccination programme (between October and February) that targets school students 6-18 years old. Typically, this school-based programme achieves 40% vaccine coverage among this age group. However, there is no funded programme for working-age adults, who pay for a seasonal flu vaccine themselves (out-of-pocket), and thus the annual coverage levels are typically around 10% in this age group. The government would like to reduce flu-related deaths and hospitalisations each year and is considering whether to try to increase vaccine use and needs to understand the impact of different strategies.

You have been tasked to predict the impact of two potential strategies on flu-related hospitalisations and deaths. The first strategy is to increase the vaccine coverage among school students using public health campaigns to provide information on flu and vaccines to parents and schools; colleagues in the Immunisation Division believe this campaign would increase the vaccine coverage to 75% given results from a recent pilot study. The second strategy would be to increase vaccine coverage among working-age adults from 10% to 40%.

Design a model that could help you complete this task. For instance, you may wish to include the following:

- A compartment diagram of the disease including demographic states that you wish your model to track (showing arrows between your compartments denoting flows).
- Any further information on the model set-up (e.g. whether you wish to use a stochastic model and if so what type)
- A short list of information or parameters that you need to run your model
- Any values of these parameters needed (you may find googling helpful here - remember to state your source)
- A short list of where any uncertainty is in your assumptions or parameter values.