Syria covid SEIAQRD model

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The set of equations are:

$$\dot{S} = -\beta_A A - \beta_I I$$
$$\dot{E} = \beta_A A + \beta_I I - \delta_E E$$
$$\dot{A} = \sigma \delta_E E - \gamma_A A$$
$$\dot{I} = (1-\sigma)\delta_E E - \gamma_I I - \alpha_I I - \eta q I$$
$$\dot{Q} = \eta q I - \gamma_Q Q - \alpha_Q Q$$
$$\dot{R} = \gamma_I I + \gamma_A A + \gamma_Q Q$$
$$\dot{D} = \alpha_I I + \alpha_Q Q$$

With the compartments $\dot{S}$, susceptibles, $\dot{E}$, exposed (latent), $\dot{A}$, infectious-asymptomatic, $\dot{I}$, infectious-symptomatic, $\dot{Q}$, quarantined, $\dot{R}$, recovered, $\dot{D}$, dead.

The parameters are:

Transmission rate- β_A (asymptomatic), β_I (symptomatic)
Rate at which exposed become infectious- δ_E
Proportion that are asymptomatic- σ
Recovery rate- γ_A (asymptomatic), γ_I (symptomatic), γ_Q (quarantined)
Fatality rate- α_I (symptomatic), α_Q (quarantined)
Proportion that can be quarantined q, at rate η

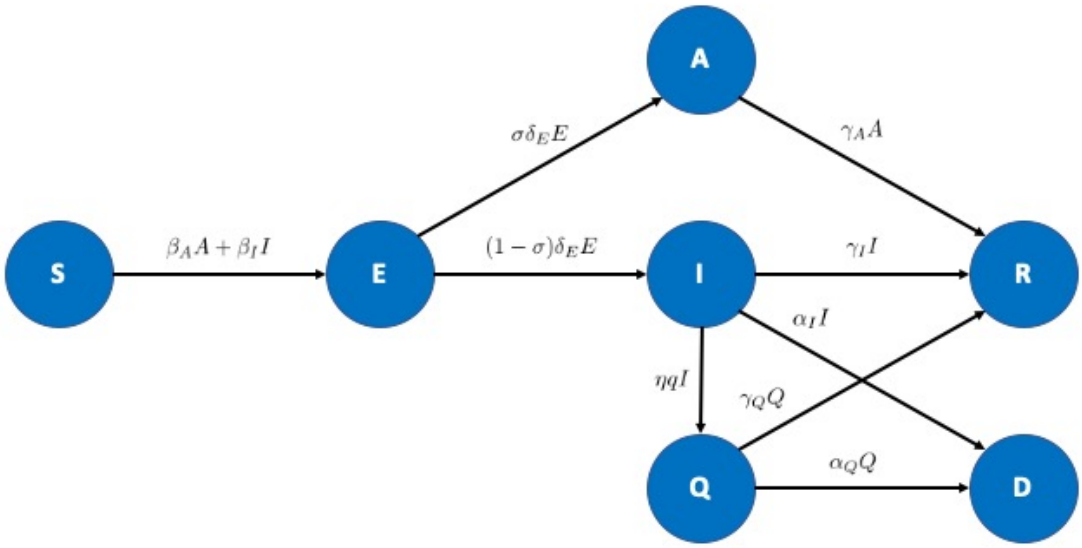

Figure 1: Model schematic