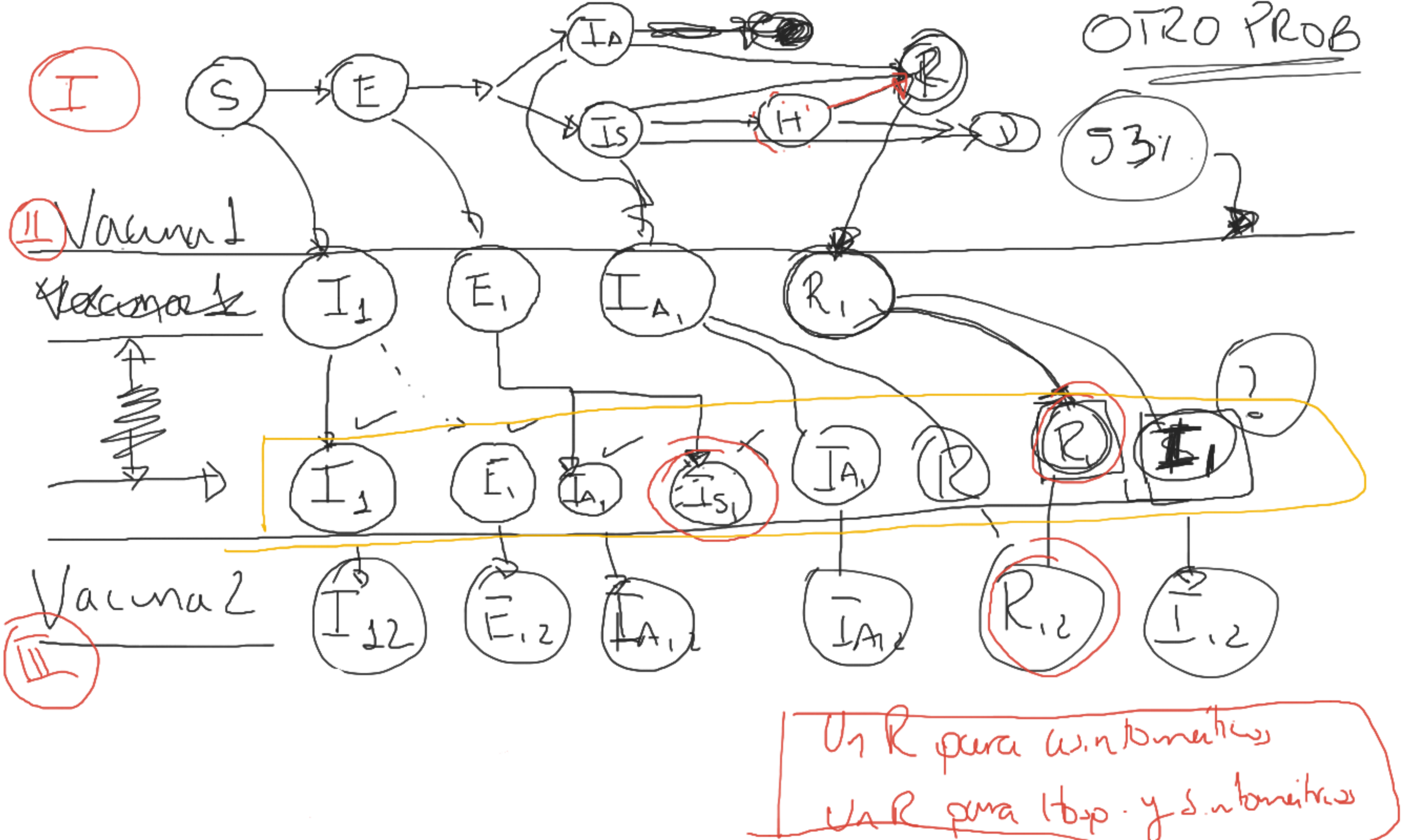
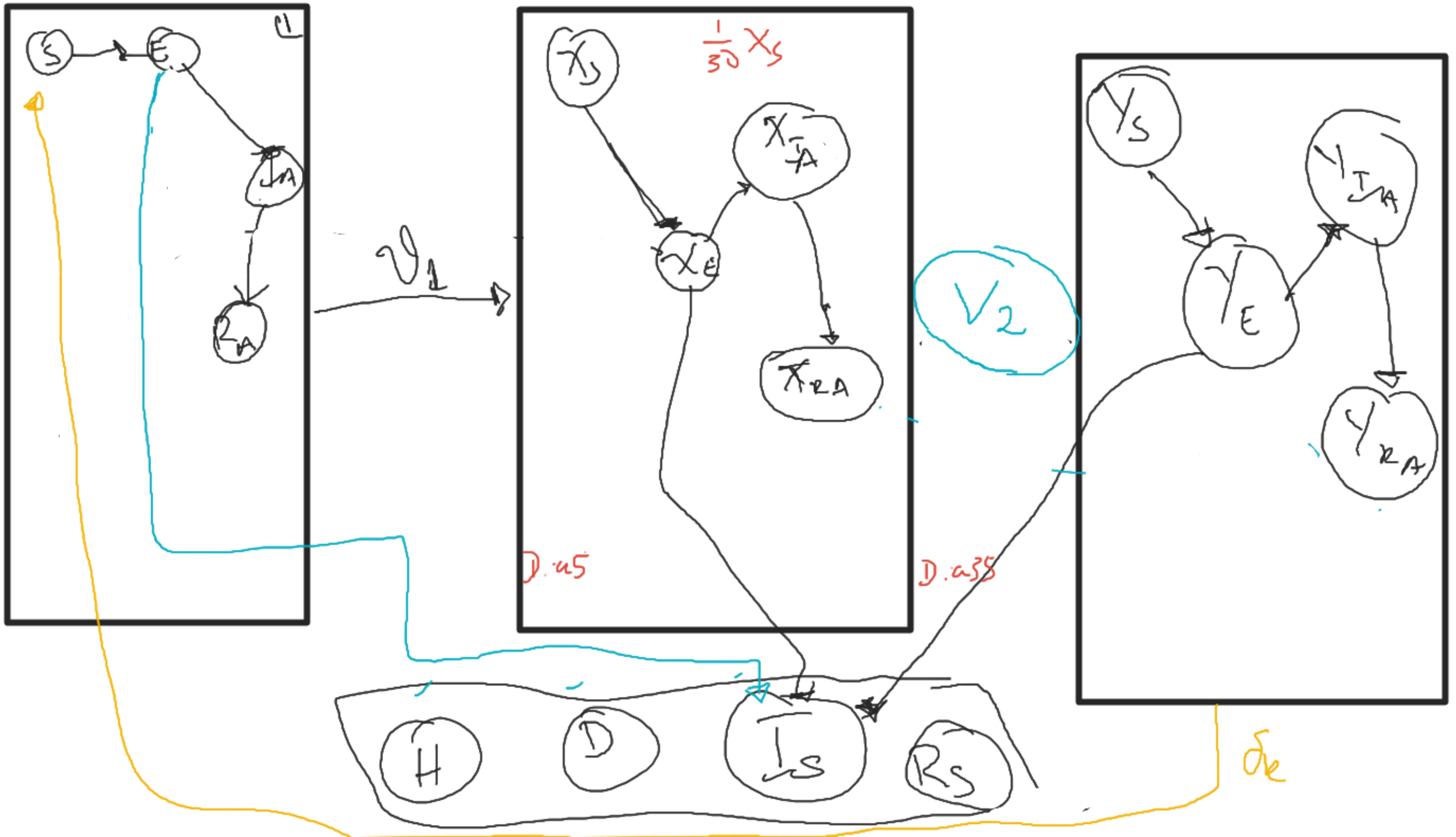

OTRO PROB
I
S
E
I_A
I_S
H'
R
D
53'
II Vacuna 1
I_1
E_1
I_{A_1}
R_1
I_1
E_1
I_{A_1}
I_{S_1}
I_A
R
R_1
I_1
?
III Vacuna 2
I_{12}
E_{12}
$I_{A_{12}}$
I_{A_2}
R_{12}
I_{12}
U1 R para asintomáticos
UnR para Hosp. y sintomáticos



S
E
I_A
R_A
v_1
$\frac{1}{30} X_S$
X_S
X_{I_A}
X_E
X_{R_A}
D.a5
V_2
D.a35
Y_S
Y_{I_A}
Y_E
Y_{R_A}
H
D
I_S
R_S
δ_k

Stage 1 $N^* = N - D$

$$S' = \mu N^* - (\lambda_f + \lambda_{v_1} + \mu) S + \delta_{R_A} \gamma_{R_A} + \delta_k R_A + \delta_{R_S} R_S + \delta^A_{R_A} W_{R_A}$$

$$E' = \lambda_f S - (\delta_E + \lambda_{v_1} + \mu) E$$

$$I_S' = p \delta_E E - (\delta_H + \alpha_S + \mu_{I_S} + \mu) I_S + p(\tilde{\delta}_E \chi_E + \tilde{\delta}_E \gamma_E + \bar{\delta}_E Z_E + \delta^*_E W_E)$$

$$I_A' = (1-p)\delta_E E - (\alpha_A + \lambda_{v_1} + \mu) I_A$$

$$H' = \delta_H I_S - (\alpha_H + \mu_H + \mu) H$$

$$R_S' = \alpha_S I_S + \alpha_H H - (\delta_{R_S} + \mu) R_S$$

$$R_A' = \alpha_A I_A - (\lambda_v + \delta_R + \mu) R_A$$

$$D' = \mu_{I_S} I_S + \mu_H H$$

$$\lambda_f^S := \beta_S I_S$$

$$\lambda_f^A = \beta_A (I_A + \chi_{I_A} + \gamma_{I_A})$$

$$\lambda_f := \frac{\lambda_f^S + \lambda_f^A}{N^{**}}$$

$$N^A = N - D$$

$$N^{**} = N^* - H$$

Stage 2

$$\dot{x}_S = q\lambda_{V_1} S - \left((1-\varepsilon)\lambda_f + \lambda_{V_2}^A + \mu\right) x_S$$

$$\lambda_{V_1}^A = q\lambda_{V_1}$$

$$\lambda_{V_1}^B = (1-q)\lambda_{V_1}$$

$$\dot{x}_E = q\lambda_{V_1} E + (1-\varepsilon)\lambda_f x_S - \left(\lambda_{V_2}^A + \widehat{\delta_E} + \mu\right) x_E$$

$$\dot{x}_{I_A} = q\lambda_{V_1} I_A + (1-\rho)\widehat{\delta_E}\, x_E - \left(\lambda_{V_2}^A + \widehat{\alpha_A} + \mu\right) x_{I_A}$$

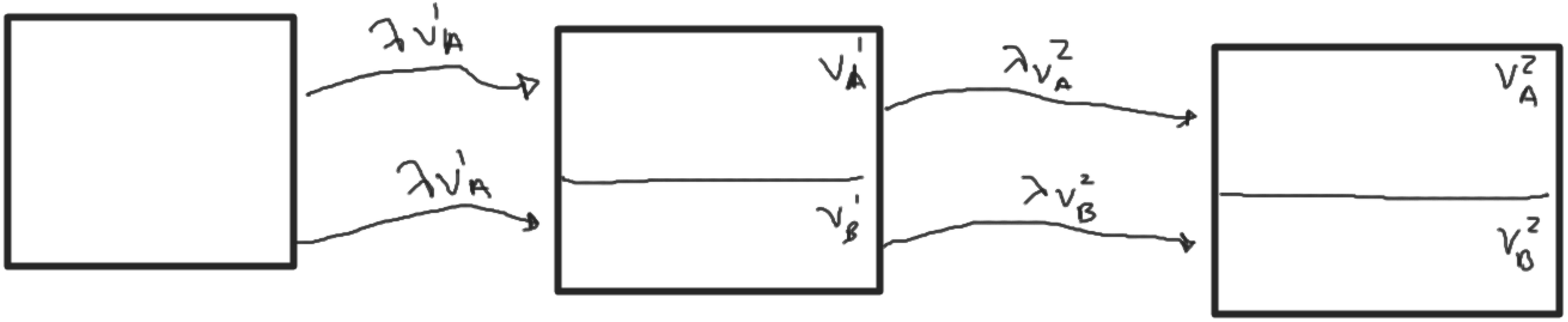
$$\dot{x}_{R_A} = q\lambda_{V_1} R_A + \widehat{\alpha_A}\, x_{I_A} - \left(\lambda_{V_2}^A + \mu\right) x_{R_A}$$

$$\dot{y}_S = \lambda_{V_2}^A x_S - \left((1-\tilde{\varepsilon})\lambda_f + \mu\right) y_S$$

$$\dot{y}_E = \lambda_{V_2}^A x_E + (1-\tilde{\varepsilon})\lambda_f y_S - \left(\tilde{\delta}_E + \mu\right) y_E$$

$$\dot{y}_{I_A} = \lambda_{V_2}^A x_{I_A} + (1-p)\tilde{\delta}_E y_E - \left(\tilde{\alpha}_A + \mu\right) y_{I_A}$$

$$\dot{y}_{R_A} = \lambda_{V_2}^A x_{R_A} + \tilde{\alpha}_A y_{I_A} - \left(\delta_{R_A} + \mu\right) y_{R_A}$$



$$\lambda_f^s := \beta_s I_s$$

$$\lambda_f^A := \beta_A \left(I_A + \chi_{I_A} + \gamma_{I_A} + \zeta_{I_A} + w_{I_A} \right)$$

$$\dot{Z}_S = (1-q)\lambda_{V_1} S - \left((1-\eta)\lambda_f + \lambda^B_{V_2} + \mu\right) Z_S$$

$$\dot{Z}_E = (1-q)\lambda_{V_1} E + (1-\eta)\lambda_f Z_S - \left(\lambda^B_{V_2} + \overline{\delta}_E + \mu\right) Z_E$$

$$\dot{Z}_{I_A} = (1-q)\lambda_{V_1} I_A + (1-p)\overline{\delta}_E Z_E - \left(\lambda^B_{V_2} + \overline{\alpha}_A + \mu\right) Z_{I_A}$$

$$\dot{Z}_{R_A} = (1-q)\lambda_{V_1} R_A + \overline{\alpha}_A Z_{I_A} - \left(\lambda^B_{V_2} + \mu\right) Z_{R_A}$$

$$\dot{W}_S = \lambda^B_{V_2} Z_S - \left((1-\bar{\pi})\lambda_f + \mu\right) W_S$$

$$\dot{W}_E = \lambda^B_{V_2} Z_E + (1-\bar{\pi})\lambda_f W_S - \left(\delta^*_E + \mu\right) W_E$$

$$\dot{W}_{I_A} = \lambda^B_{V_2} Z_{I_A} + (1-p)\delta^*_E W_E - \left(\alpha^*_A + \mu\right) W_{I_A}$$

$$\dot{W}_{R_A} = \lambda^B_{V_2} Z_{R_A} + \alpha^*_A W_{I_A} - \left(\delta^*_{R_A} + \mu\right) W_{R_A}$$