

eqn	$\Delta X(t)/ts$		S_neg	L_neg	DSP_neg	USP_neg	DSN_neg	USN_neg
1	S_neg	(1-lat)*M(t)	-lam(t) -hivinc -mu_neg					
2	L_neg	lat*M(t)	+(1-pp_neg)*lam(t)	-er_neg -hivinc -mu_neg -lr_neg*pp_neg*lam(t)	+dx*tx*sn_smpos +cure	+cure	+dx*tx*sn_smneg +cure	+cure
3	DSP_neg		+fp_neg*acc*pp_neg*lam(t)	+fp_neg*acc*[er_neg +lr_neg*pp_neg*lam(t)]	-hivinc -mu_smpos_neg -dx*tx*sn_smpos -cure			
4	USP_neg		+fp_neg*(1-acc)*pp_neg* lam(t)	+fp_neg*(1-acc)*[er_neg +lr_neg*pp_neg*lam(t)]		-hivinc -mu_smpos_neg -cure		
5	DSN_neg		+(1-fp_neg)*acc*pp_neg* lam(t)	+(1-fp_neg)*acc*[er_neg +lr_neg*pp_neg*lam(t)]			-hivinc -mu_smneg_neg -dx*tx*sn_smneg -cure	
6	USN_neg		+(1-fp_neg)*(1-acc)*pp_neg* lam(t)	+(1-fp_neg)*(1-acc)*[er_neg +lr_neg*pp_neg*lam(t)]				-hivinc -mu_smneg_neg -cure

eqn	$\Delta X(t)/ts$		S_hiv	L_hiv	DSP_hiv	USP_hiv	DSN_hiv	USN_hiv
7	S_hiv	+hivinc*S_neg(t)	-lam(t) -hivprog -mu_hiv					
8	L_hiv	+hivinc*L_neg(t)	+(1-pp_hiv)*lam(t)	-er_hiv -hivprog -mu_hiv -lr_hiv*pp_hiv*lam(t)	+dx*tx*sn_smpos			
9	DSP_hiv	+hivinc*DSP_neg(t)	+fp_hiv*acc*pp_hiv*lam(t)	+fp_hiv*acc*[er_hiv +lr_hiv*pp_hiv*lam(t)]	-hivprog -mu_tb_hiv -dx*tx*sn_smpos			
10	USP_hiv	+hivinc*USP_neg(t)	+fp_hiv*(1-acc)*pp_hiv* lam(t)	+fp_hiv*(1-acc)*[er_hiv +lr_hiv*pp_hiv*lam(t)]		-hivprog -mu_tb_hiv		
11	DSN_hiv	+hivinc*DSN_neg(t)	+(1-fp_hiv)*acc*pp_hiv* lam(t)	+(1-fp_hiv)*acc*[er_hiv +lr_hiv*pp_hiv*lam(t)]			-hivprog -mu_tb_hiv -dx*tx*sn_smneg	
12	USN_hiv	+hivinc*USN_neg(t)	+(1-fp_hiv)*(1-acc)*pp_hiv* lam(t)	+(1-fp_hiv)*(1-acc)*[er_hiv +lr_hiv*pp_hiv*lam(t)]				-hivprog -mu_tb_hiv

eqn	$\Delta X(t)/ts$		S_aids	L_aids	DSP_aids	USP_aids	DSN_aids	USN_aids
13	S_aids	+hivprog*S_hiv(t)	-lam(t) -mu_aids					
14	L_aids	+hivprog*L_hiv(t)	+(1-pp_aids)*lam(t)	-er_aids -mu_aids -lr_aids*pp_aids*lam(t)	+dx*tx*sn_smpos			
15	DSP_aids	+hivprog*DSP_hiv(t)	+fp_aids*acc*pp_aids*lam(t)	+fp_aids*acc*[er_aids +lr_aids*pp_aids*lam(t)]	-mu_tb_aids -dx*tx*sn_smpos			
16	USP_aids	+hivprog*USP_hiv(t)	+fp_aids*(1-acc)*pp_aids* lam(t)	+fp_aids*(1-acc)*[er_aids +lr_aids*pp_aids*lam(t)]		-mu_tb_aids		
17	DSN_aids	+hivprog*DSN_hiv(t)	+(1-fp_aids)*acc*pp_aids* lam(t)	+(1-fp_aids)*acc*[er_aids +lr_aids*pp_aids*lam(t)]			-mu_tb_aids -dx*tx*sn_smneg	
18	USN_aids	+hivprog*USN_hiv(t)	+(1-fp_aids)*(1-acc)*pp_aids* lam(t)	+(1-fp_aids)*(1-acc)*[er_aids +lr_aids*pp_aids*lam(t)]				-mu_tb_aids