Appendix 1. Description of equation (1).

Variables	Type	Equation
% of detection PD according to health care access	Con.	{0.05, 0.09, 0.1}
% of education	Con.	0.78
% of Progression to D with SCB	Con.	0.048
% of progression to D without SCB	Con.	0.11
% of recovery to NG	Con.	0.16
% of SCB compliance	Con.	0.55
APD education rate	Aux.	IF(APD<100, 0, 1) * 'New educated APD'*APD
APD rate	Aux.	IF(PD<100, 0, 1) * PD*FOR(i=1..1000| ARRSUM('New APD'[*,i]))
Array of accessibility	Aux.	{IF('Array of classified accessibility'=1,1,0),IF('Array of classified accessibility'=2,1,0),IF('Array of classified accessibility'=3,1,0)}
Array of classified accessibility	Aux.	FOR(i=1..1000|IF('Number of doctor visit'[i]<=1,1, IF('Number of doctor visit'[i]<=3, 2, 3)))
New APD	Aux.	{IF(CUMULATIVESUM('Array of accessibility'[1,*])<='Population of PD'[1], 1, 0)*'Array of accessibility'[1,*], IF(CUMULATIVESUM('Array of accessibility'[2,*])<='Population of PD'[2], 1, 0)*'Array of accessibility'[2,*], IF(CUMULATIVESUM('Array of accessibility'[3,*])<='Population of PD'[3], 1, 0)*'Array of accessibility'[3,*]}
New D with NSCB	Aux.	IF(CUMULATIVESUM(MIN(1,NSCB[*]))<='PopulationofNSCB',1,0)*MIN(1,NSCB)
New D with SCB	Aux.	IF(CUMULATIVESUM(MIN(1,SCB[*]))<='Target of progression from SCB to D', 1, 0) * MIN(1, SCB) - 'New NG'
New D with UAPD	Aux.	IF(CUMULATIVESUM(MIN(1,UAPD[*]))<='PopulationofUAPD',1,0)*MIN(1,UAPD)
New educated APD	Aux.	IF(CUMULATIVESUM(MIN(1,APD[*]))<='Population of APD', 1, 0) * MIN(1, APD)
New NG	Aux.	IF(CUMULATIVESUM(MIN(1,SCB[*]))<='Population of SCB', 1, 0) * MIN(1, SCB)

Appendix 2. Description of equation (2).

Variables	Type	Equation
New SCB	Aux.	IF(CUMULATIVESUM(MIN(1,'educated APD'[*]))<='Population of educated APD', 1, 0) * MIN(1, 'educated APD')
NSCB rate	Aux.	IF('educated APD'<100, 0, 1) * IF('New SCB'=1, 0, 1) * 'educated APD'
Number of doctor visit	Con.	'Population of PD data'[*,2]
Number of SCB	Aux.	MIN(1, SCB)
PD	Lev.	'Population of PD data'[*,1]
Population of APD	Aux.	IF('Simulation2'=0, IF(ARRSUM(MIN(1,APD))<=11, APD*'% of education' , FLOOR(ARRSUM(IF(APD>0,1,0))*'% of education')), IF(ARRSUM(MIN(1,APD))<=11, APD*'% of education' , FLOOR(ARRSUM(IF(APD>0,1,0))*'Scenario 2')))
Population of educated APD	Aux.	IF(ARRSUM(MIN(1,'educatedAPD'))<=11,'educatedAPD'*'%ofSCBcompliance', FLOOR(ARRSUM(IF('educated APD'>0,1,0))*'% of SCB compliance'))
Population of NSCB	Aux.	IF(ARRSUM(MIN(1,NSCB))<=11,NSCB*NSCB, FLOOR(ARRSUM(IF(NSCB>0,1,0))*'% of progression to D without SCB'))
Population of PD	Aux.	IF('Simulation1'=0, {IF(ARRSUM(MIN(1,'Array of accessibility'))<=11,'Array of accessibility'[1,*]*'% of detection PD according to health care access'[1] ,FLOOR(ARRSUM('Array of accessibility'[1,*])*'% of detection PD according to health care access'[1])), IF(ARRSUM(MIN(1,'Array of accessibility'))<=11,'Array of accessibility'[1,*]*'% of detection PD according to health care access'[1] ,FLOOR(ARRSUM('Array of accessibility'[2,*])*'% of detection PD according to health care access'[2])), IF(ARRSUM(MIN(1,'Array of accessibility'))<=11,'Array of accessibility'[1,*]*'% of detection PD according to health care access'[1] ,FLOOR(ARRSUM('Array of accessibility'[3,*])*'% of detection PD according to health care access'[3]))}, IF(ARRSUM('Array of accessibility')<=11,'Array of accessibility'*'% of detection PD according to health care access'[1] ,FLOOR(ARRSUM('Array of accessibility'[*,*])*'Scenario 1')))
Population of PD data	Con.	XLDATA("pd-data.xlsx", "Sheet1", "R6C4:R1005C6")
Population of SCB	Aux.	IF(ARRSUM(MIN(1,'NumberofSCB'))<=11,SCB*'% of recovery to NG', FLOOR(ARRSUM(IF(SCB>0,1,0))*'% of recovery to NG'))
Population of UAPD	Aux.	IF(ARRSUM(MIN(1,UAPD))<=11,UAPD*'%of progression to D without SCB', FLOOR(ARRSUM(IF(UAPD>0,1,0))*'% of progression to D without SCB'))

Appendix 3. Description of equation (3).

Variables	Type	Equation
Prior NSCB	Aux.	IF(NSCB<100, 0, 1) * MIN(1, NSCB) * 'return from NSCB to PD' - 'Rate of progression to D with NSCB'
Prior UAPD	Aux.	IF(UAPD<100, 0, 1) * MIN(1, UAPD) * 'return from NSCB to PD'
Rate of progression from UAPD to D	Aux.	IF(UAPD<100, 0, 1) * 'New D with UAPD'*UAPD
Rate of progression to D with NSCB	Aux.	IF(NSCB<100, 0, 1) * NSCB * 'New D with NSCB'
Rate of progression to D with SCB	Aux.	IF(SCB<100, 0, 1) * SCB * 'New D with SCB'
Rate of recovery to NG	Aux.	IF(SCB<100, 0, 1) * SCB * 'New NG'
return from NSCB to PD	Aux.	IF(UAPD<100, 0, 1)*UAPD + NSCB - 'progress rate from UAPD to D' - 'Rate of progression to D with NSCB'
SCB rate	Aux.	IF('educated APD'<100, 0, 1) * 'educated APD' * 'New SCB'
Population of potential D with SCB	Aux.	IF(ARRSUM(MIN(1,SCB))<=11,SCB*'% of recovery to NG', FLOOR(ARRSUM(IF(SCB>0,1,0))*'% of Progression to D with SCB'*3.352))
total population of D	Aux.	ARRSUM(MIN(1,'D with SCB') + MIN(1,'D with NSCB'))
UAPD rate		IF(PD<100, 0, 1) * FOR(i=1..1000|IF('APD rate'[i]=0, 1, 0) * PD[i])