**Load\_Cal\_Data.m**

Added NSP data extraction—antoine is this the correct syntax  
% NSP

filename = 'Data\_Files/Parameter\_Data/PWID\_prop\_NSP\_com.csv';

opts = detectImportOptions(Filename);

opts = setvartype(opts,{'Est','LI','UI'},'double');

dataTable = readtable(filename,opts);

ind = strcmp(dataTable.ISO, ISO);

data = dataTable(strcmp(dataTable.ISO,ISO),:);

PWID\_prop\_NSP\_com.time\_pt = data.Date;

PWID\_prop\_NSP\_com.estimate = data.Est;

**LoadPriors.m**

Added RR on NSP

% relative risk of hiv transmission through idu if on NSP

priors.RR\_HIV\_NSP = make\_lognormal\_dist([0.66,0.43,1.01]);

**Ukraine\_model.m**

%added time-varing NSP coverage and impact of NSP in foi

%%%new 6/8/22

if t<params.NSP\_start\_date

propNSP=0;

elseif t>params.NSP\_start\_date && t< PWID\_prop\_NSP\_com.time\_pt

propNSP=((t-params.NSP\_start\_date)/(PWID\_prop\_NSP\_com.time\_pt -params.NSP\_start\_date))\*PWID\_prop\_NSP\_com.estimate ;

elseif t>PWID\_prop\_NSP\_com.time\_pt

propNSP=PWID\_prop\_NSP\_com.estimate ;

end

%% HIV force of infection through Injecting transmission

%%edited 6/8/22

%%edited 6/8/22

%%edited 6/8/22

HIV\_inj\_params.lambda\_com = propNSP\*params.RR\_HIV\_NSP\*params.lambda\_HIV\_inj\*sum(sum(sum(sum(sum(sum(sum(sum(sum(params.HIV\_inj\_matrix\_num(:,:,:,[1,3,4],:,:,:).\*y(:,:,:,[1,3,4],:,:,:))))))))))./...

sum(sum(sum(sum(sum(sum(sum(sum(sum(params.HIV\_inj\_matrix\_denom(:,:,:,[1,3,4],:,:,:).\*y(:,:,:,[1,3,4],:,:,:))))))))));

HIV\_inj\_params.lambda\_pris = NSP\_prison\*propNSP\*params.RR\_HIV\_NSP\*params.lambda\_HIV\_inj\*sum(sum(sum(sum(sum(sum(sum(sum(sum(params.HIV\_inj\_matrix\_num(:,:,:,2,:,:,:).\*y(:,:,:,2,:,:,:))))))))))./...

sum(sum(sum(sum(sum(sum(sum(sum(sum(params.HIV\_inj\_matrix\_denom(:,:,:,2,:,:,:).\*y(:,:,:,2,:,:,:))))))))));

HIV\_inj\_params.lambda\_com\_young = propNSP\*params.RR\_HIV\_NSP\*params.lambda\_HIV\_inj\*sum(sum(sum(sum(sum(sum(sum(sum(sum(params.HIV\_inj\_matrix\_num(:,:,1,[1,3,4],:,:,:).\*y(:,:,1,[1,3,4],:,:,:))))))))))./...

sum(sum(sum(sum(sum(sum(sum(sum(sum(params.HIV\_inj\_matrix\_denom(:,:,1,[1,3,4],:,:,:).\*y(:,:,1,[1,3,4],:,:,:))))))))));

HIV\_inj\_params.lambda\_com\_old = propNSP\*params.RR\_HIV\_NSP\*params.lambda\_HIV\_inj\*sum(sum(sum(sum(sum(sum(sum(sum(sum(params.HIV\_inj\_matrix\_num(:,:,2,[1,3,4],:,:,:).\*y(:,:,2,[1,3,4],:,:,:))))))))))./...

sum(sum(sum(sum(sum(sum(sum(sum(sum(params.HIV\_inj\_matrix\_denom(:,:,2,[1,3,4],:,:,:).\*y(:,:,2,[1,3,4],:,:,:))))))))));

GetParameters.m

-Correct Line 39, edited params2.NSP\_start\_date to params2.NSP\_end\_date

-

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% EDITS FROM ANTOINE 2022-06-08

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

**GetParameters.m**

Added line 13:

params2.RR\_HIV\_NSP = params.RR\_HIV\_NSP ;

added line 46

params2.NSP\_cal\_date = Cal\_Data.Data.PWID\_prop\_current\_NSP\_com.time\_pt;

params2.NSP\_cal\_Est = Cal\_Data.Data.PWID\_prop\_current\_NSP\_com.estimate;

**Load\_Cal\_Data.m**

Added NSP data extraction—antoine is this the correct syntax  
% NSP

filename = 'Data\_Files/Parameter\_Data/PWID\_prop\_NSP\_com.csv';

REPLACED BY

filename = 'Data\_Files/Calibration\_Data/PWID\_prop\_current\_NSP\_com\_data.csv;

% NSP

% filename = 'Data\_Files/Calibration\_Data/PWID\_prop\_current\_NSP\_com\_data.csv';

% opts = detectImportOptions(Filename);

% opts = setvartype(opts,{'Est','LI','UI'},'double');

% dataTable = readtable(filename,opts);

% ind = strcmp(dataTable.ISO, ISO);

% data = dataTable(strcmp(dataTable.ISO,ISO),:);

% PWID\_prop\_NSP\_com.time\_pt = data.Date;

% PWID\_prop\_NSP\_com.estimate = data.Est;

REPLACED BY

data\_field = 'PWID\_prop\_current\_NSP\_com';

Filename = ['Data\_Files/Calibration\_Data/',data\_field,'\_data.csv'];

opts = detectImportOptions(Filename);

opts = setvartype(opts,{'Est','LI','UI'},'double');

Cal\_data\_temp = readtable(Filename,opts);

ind = strcmp(Cal\_data\_temp.ISO, ISO);

Data.(char(data\_field)).time\_pt = Cal\_data\_temp.Date(ind);

Data.(char(data\_field)).estimate = Cal\_data\_temp.Est(ind)\*1; % MAKING SURE THIS IS PROP

Data.(char(data\_field)).lower = Cal\_data\_temp.LI(ind)\*1;

Data.(char(data\_field)).upper = Cal\_data\_temp.UI(ind)\*1;

**Ukraine.model.m**

Added lines 386-387

PWID\_prop\_NSP\_com.time\_pt =params.NSP\_cal\_date ;%2015;

PWID\_prop\_NSP\_com.estimate= params.NSP\_cal\_Est; % 0.394;

**Run\_ABC.m**

Add line 24

Get\_ART\_HR\_prison(ISO);

BY changes June 09 2022

1)  in the **ukraine\_model.m** file we hard code: lines 400-405

Prev\_f1\_external=0;

Prev\_m1\_external=0;

2) model with new calibration file **PWID\_prop\_current\_ART\_com.csv** set to 0

UA changes June 09 2022

1)  in the ukraine\_model.m file we hard code:

Corrected NSP prop in the FOI equations

June 26, 2022

WITH ALL NSP CHANGES AND NEW SCENARIOS

New NSP **PWID\_prop\_current\_NSP\_com\_data.csv** from Natasha

|  |  |  |
| --- | --- | --- |
| Country | Edits | Dates |
| UA | Already calibrated. ok | June 23 |
| KG | ART start 2013 | June 26 |
| BY | Zoe prevalence  PWID\_prop\_current\_ART\_com.csv set to 0.0001  If statement in Load Prior for prior.HIV.seed  if ISO=='BY'  priors.HIV\_seed = makedist('uniform',0.0001,0.0005);  else  priors.HIV\_seed = makedist('uniform',0.001/100,5/100);  end  I am **NOT** changing the Ukraine.model.m for now but could add  Prev\_f1\_external=0;  Prev\_m1\_external=0; | June 26 |
| TZ | seed date 2000,  initial ART start (2002) | June 26 |
| MM | I infer the LI/UI for prop\_current NSP (was missing) 0.11 and only works if we ALSO include a date/year | June 26 |
| US | No changes | June 26 |
| RU | No changes | June 26 |
| PK | No changes | June 26 |

countries=( MM RU US KG BY TZ PK )

Questions:

What about prop HIV sex???

For example

* TZ: Zoe: Prop Sex = 56.4 [39.8 -66.9]
* KG and BY 0.15 ‘0.05-0.25]

Currently when missing in the csv (most ) :

**Load\_Cal\_data.m**

if isnan(Cal\_data\_temp.Est(ind))

[estimate\_tmp,lower\_tmp,upper\_tmp] = prop\_sexual(Data.PWID\_HIV\_prevalence\_com\_pooled.estimate/100,...

Data.PWID\_HCV\_AB\_prevalence\_com.estimate/100,...

Data.PWID\_HCV\_AB\_prevalence\_com\_HIV\_pos.estimate/100);

Data.(char(data\_field)).estimate = estimate\_tmp\*100;

Data.(char(data\_field)).lower = lower\_tmp\*100;

Data.(char(data\_field)).upper = upper\_tmp\*100;

end

June 28, 2022

Bug fix: for CI, death\_param.csv had duplicated rows which makes the results code failing. Problem solved!!!

July 08 2022

Updating seed.dates for problematic countries

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ISO | Region | Country | Date | Notes |
| BY | Eastern Europe | Belarus | 1986 | new seed date instead of 1986 (03/24/2022) putting back 86 |
| EE | Eastern Europe | Estonia | 1979 | mean for Eastern Europe instead of 2000 |
| GE | Eastern Europe | Georgia | 1979 | mean for Eastern Europe instead of 1994 |
| KG | Central Asia | Kyrgyzstan | 1976 | new seed date instead of 1976 (03/24/2022) back 1976 |
| TJ | Central Asia | Tajikistan | 1976 | mean for Central Asia instead of 1998 |

July 15 2022

New cost file loaded with **Get\_Costs.m**

Get\_Costs.m is called in **Results\_Disability\_concatenated4.m (line 5)**

Change model\_proj > **model\_proj4**

* Including costs which is called from **Results\_Disability\_concatenated4.m**

% STATUS QUO

filename = [dir,'/Status\_quo\_',num2str(k),'.mat'];

if isfile(filename)==0

Status\_quo = model\_proj4(params,SS,0,Disability\_weights,Disability\_weights\_PWID,Disability\_weights\_HIV,ARTUnitCost);

save(filename,'Status\_quo')

end

to run it, use **ABC\_Combine\_Results\_iterative4.m** which is calling **Results\_Disability\_concatenated4.m**

also modified **ABC\_plot\_john\_projections\_duration\_new8.m**

* New HIV injection (PWID\*(1-prev)\*inc
* Saving costs

July 16 2022

Adding OST and NSP costs

Change model\_proj > **model\_proj5**

use **ABC\_Combine\_Results\_iterative5.m and Results\_Disability\_concatenated5.m**