

Mars Censere Test Notebook

Richard Offer et al

This is a RStudio Test Notebook that is used to see how the simulation is running prior to committing.

It requires a database that has been already been generated.

Loaded Database Details

	Value	Details
Path	9edcfcf7-f94a-4efd-b208-c4a6c380bcc6.db	
File Size	32 MBytes	
Last Modified	2020-01-02 13:21:04	
# Simulations	5	

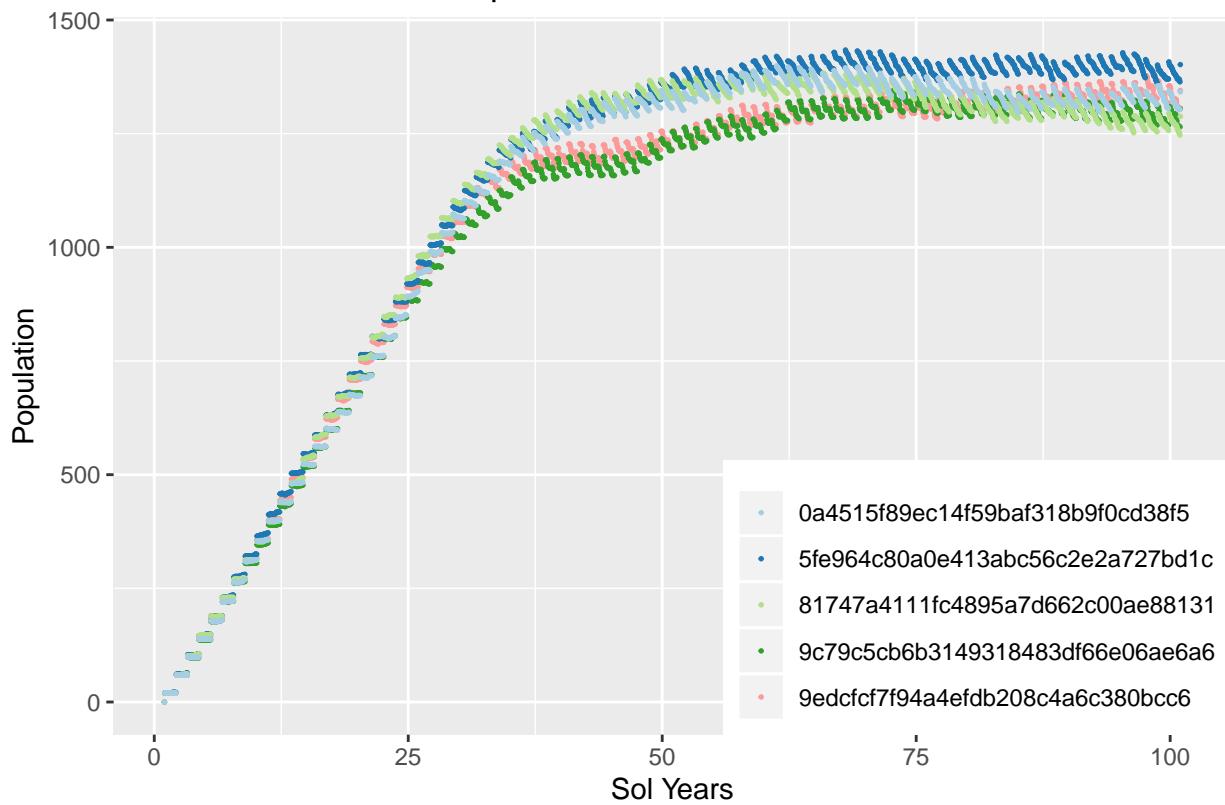
ID	Landed	Ends	#Sols	Pop.	Args
9edcfcf7f94a4efdb208c4a6c380bcc6	2024-01-01	2211-12-03	66800	1345	astronaut_age_range=randrange:32,46 astronaut_gender_ratio=50,50 astronaut_life_expectancy=cdc: continue_simulation=database_dir=/Users/richard/db/ first_child_delay=randint:350,700 fraction_relationships_having_children=0.25 fraction_singles_pairing_per_day=0.01 initial_mission_lands=2024-01-01 00:00:00.000+00:00 limit=sols limit_count=66800 martian_gender_ratio=50,50 martian_life_expectancy=cdc: mission_lands=randint:759,759 orientation=90,6,4 settlers_per_initial_ship=randint:20,20 settlers_per_ship=randint:40,40 ships_per_initial_mission=randint:1,1 ships_per_mission=randint:1,1 sols_between_siblings=triangle:300,700,1200 use_ivf=False
9c79c5cb6b3149318483df66e06ae6a6	2024-01-01	2211-12-03	66800	1305	astronaut_age_range=randrange:32,46 astronaut_gender_ratio=50,50 astronaut_life_expectancy=cdc: continue_simulation=database_dir= first_child_delay=randint:350,700 fraction_relationships_having_children=0.25 fraction_singles_pairing_per_day=0.01 initial_mission_lands=2024-01-01 00:00:00.000+00:00 limit=sols limit_count=66800 martian_gender_ratio=50,50 martian_life_expectancy=cdc: mission_lands=randint:759,759 orientation=90,6,4 settlers_per_initial_ship=randint:20,20 settlers_per_ship=randint:40,40 ships_per_initial_mission=randint:1,1 ships_per_mission=randint:1,1 sols_between_siblings=triangle:300,700,1200 use_ivf=True

(continued)

ID	Landed	Ends	#Sols	Pop.	Args
5fe964c80a0e413abc56c2e2a727bd1c	2024-01-01	2211-12-03	66800	1402	astronaut_age_range=triangle:28,32,48 astronaut_gender_ratio=50,50 astronaut_life_expectancy=cdc: continue_simulation= database_dir= first_child_delay=randint:350,700 fraction_relationships_having_children=0.25 fraction_singles_pairing_per_day=0.01 initial_mission_lands=2024-01-01 00:00:00.000+00:00 limit=sols limit_count=66800 martian_gender_ratio=50,50 martian_life_expectancy=cdc: mission_lands=randint:759,759 orientation=90,6,4 settlers_per_initial_ship=randint:20,20 settlers_per_ship=randint:40,40 ships_per_initial_mission=randint:1,1 ships_per_mission=randint:1,1 sols_between_siblings=triangle:300,700,1200 use_ivf=True
81747a4111fc4895a7d662c00ae88131	2024-01-01	2211-12-03	66800	1288	astronaut_age_range=triangle:28,32,48 astronaut_gender_ratio=50,50 astronaut_life_expectancy=cdc: continue_simulation= database_dir= first_child_delay=randint:350,700 fraction_relationships_having_children=0.25 fraction_singles_pairing_per_day=0.01 initial_mission_lands=2024-01-01 00:00:00.000+00:00 limit=sols limit_count=66800 martian_gender_ratio=50,50 martian_life_expectancy=cdc: mission_lands=randint:759,759 orientation=90,6,4 settlers_per_initial_ship=randint:20,20 settlers_per_ship=randint:40,40 ships_per_initial_mission=randint:1,1 ships_per_mission=randint:1,1 sols_between_siblings=triangle:300,400,600 use_ivf=True
0a4515f89ec14f59baf318b9f0cd38f5	2024-01-01	2211-12-03	66800	1342	astronaut_age_range=triangle:25,32,48 astronaut_gender_ratio=50,50 astronaut_life_expectancy=cdc: continue_simulation= database_dir= first_child_delay=randint:350,700 fraction_relationships_having_children=0.25 fraction_singles_pairing_per_day=0.01 initial_mission_lands=2024-01-01 00:00:00.000+00:00 limit=sols limit_count=66800 martian_gender_ratio=50,50 martian_life_expectancy=cdc: mission_lands=randint:759,759 orientation=90,6,4 settlers_per_initial_ship=randint:20,20 settlers_per_ship=randint:40,40 ships_per_initial_mission=randint:1,1 ships_per_mission=randint:1,1 sols_between_siblings=triangle:300,400,600 use_ivf=True

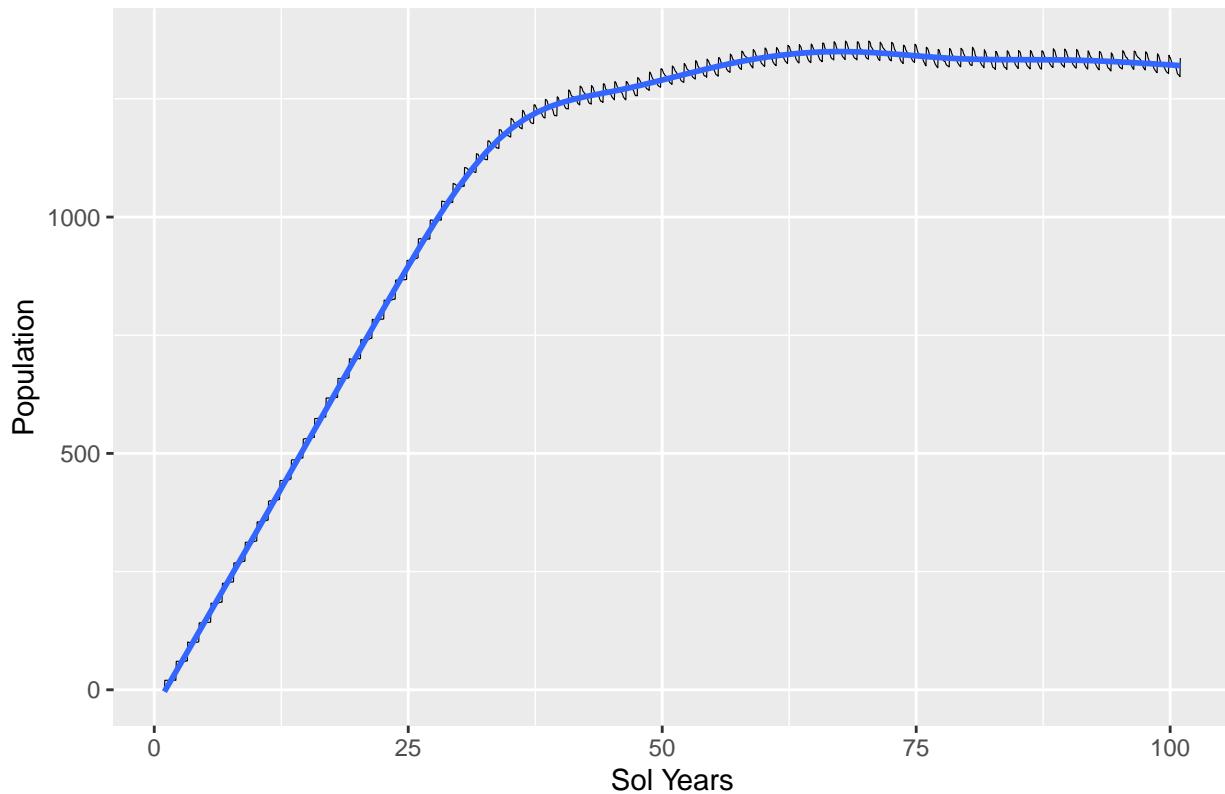
Database Overview

Simulation of Martian Population Growth



Any unevenness at the target population limit is due to the simulations with the highest population count completing their target earlier, and obviously if the simulation with the highest population is removed, then the average will drop. Hence the short term spike and drops.

Mean & Smoothed Mean of Population Growth Across All Simulations

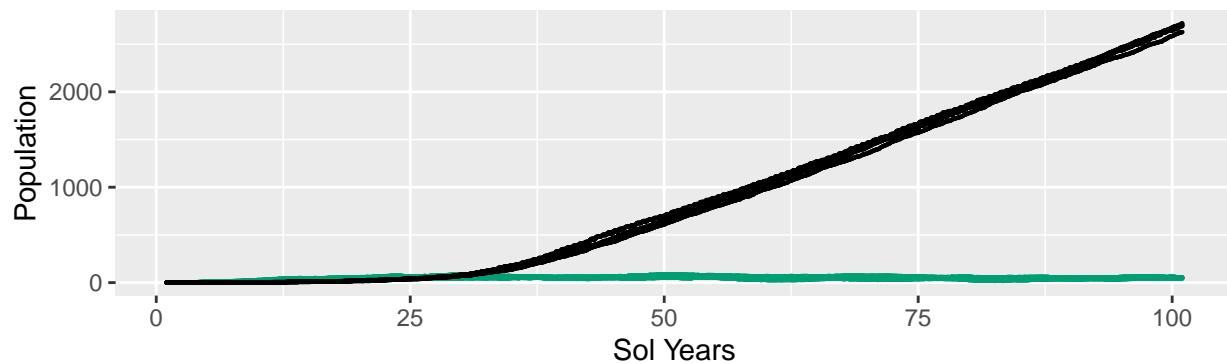


As a fraction in population, you should still see the impact of new missions landing, the sudden influx of adults depresses the fraction of population that are children.

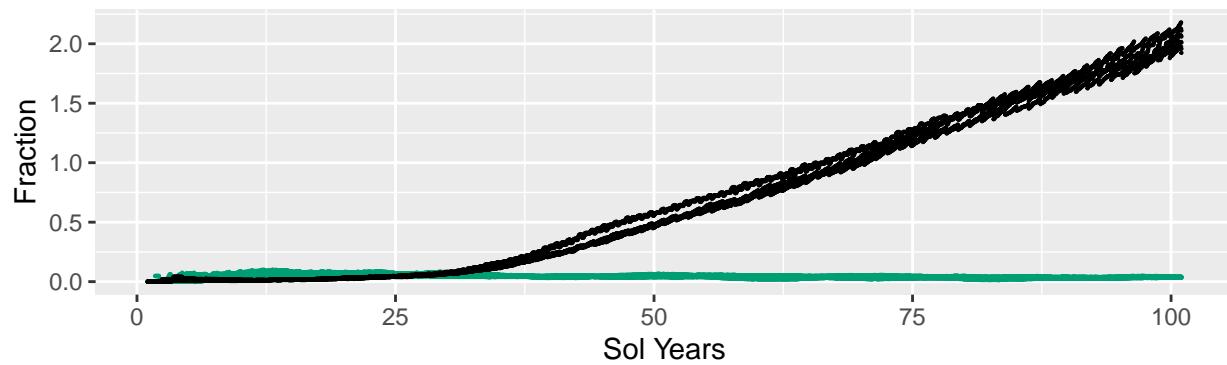
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## Warning: Removed 5 rows containing missing values (geom_point).
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## Warning: Removed 5 rows containing missing values (geom_point).
```

Births and Deaths

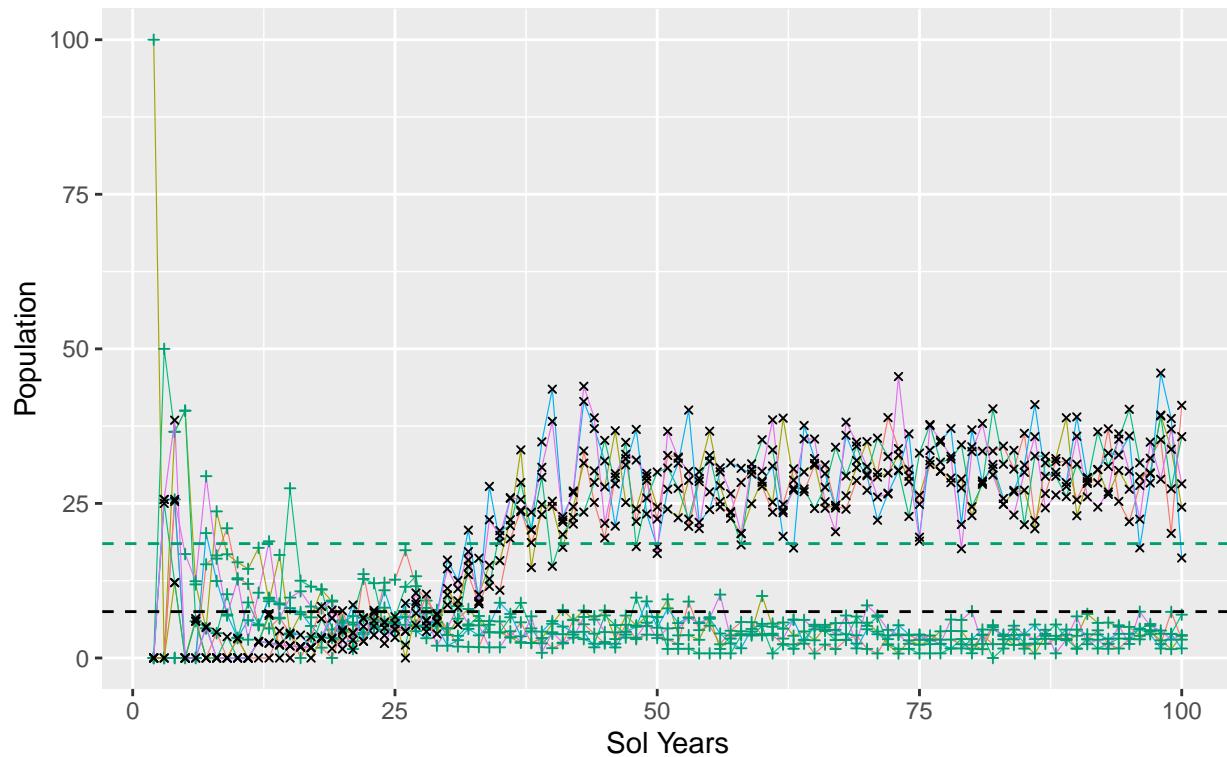


... as Fraction of Population



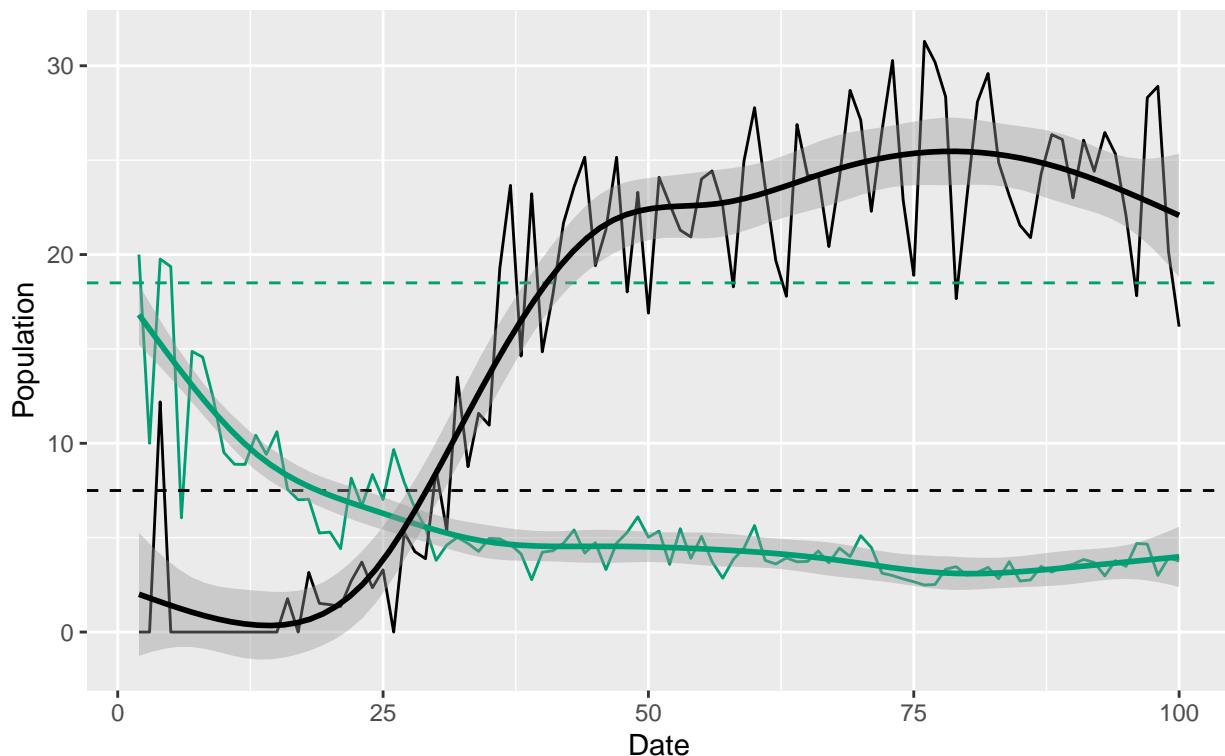
Population Demographics

Annual Birth and Death Rates per 1000 population (cf. 2016 Global)



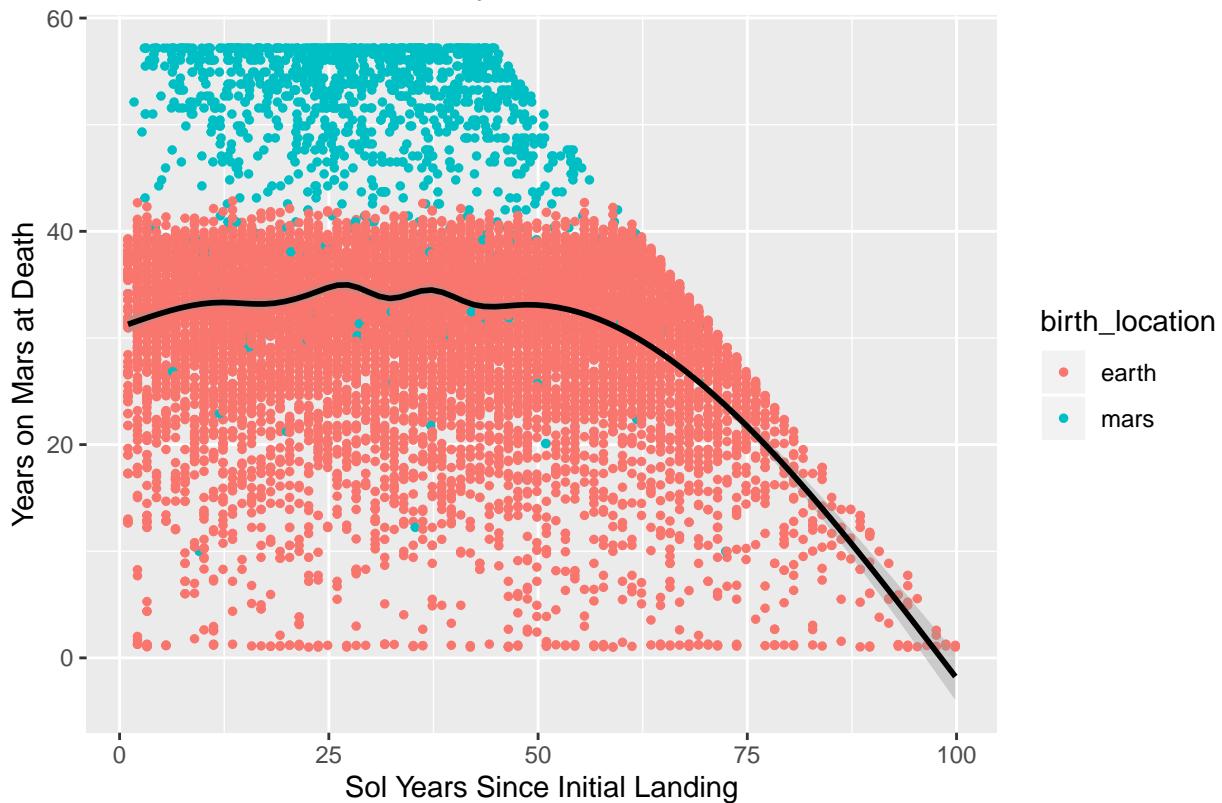
https://en.wikipedia.org/wiki/Birth_rate

Mean Birth and Death Rates per 1000 population (cf. 2016 Global)



https://en.wikipedia.org/wiki/Birth_rate

Years on Mars at Death by Cohort



Settler Dies Event Age by Cohort



Population Pyramid

