# BENCHMARK SCENARIO "POPULATION RESPONSE TO CHRONIC RADIATION EXPOSURE"

## Preliminary model comparison

## Benchmark scenario ”Population response to chronic irradiation”.

**Populations of the following species are subjected to chronic low-LET radiation exposure with dose rates 10, 20, 30, 50 mGy/day:**

- **Generic mice population;**
- **Generic hare/rabbit population;**
- **Generic wolf/wild dog population;**
- **Generic deer population.**

**Before irradiation, each population was in stable state, consisting of 1000 animals, which corresponds to the carrying capacity of the ecosystem.**

**The duration of exposure is 5 years.**

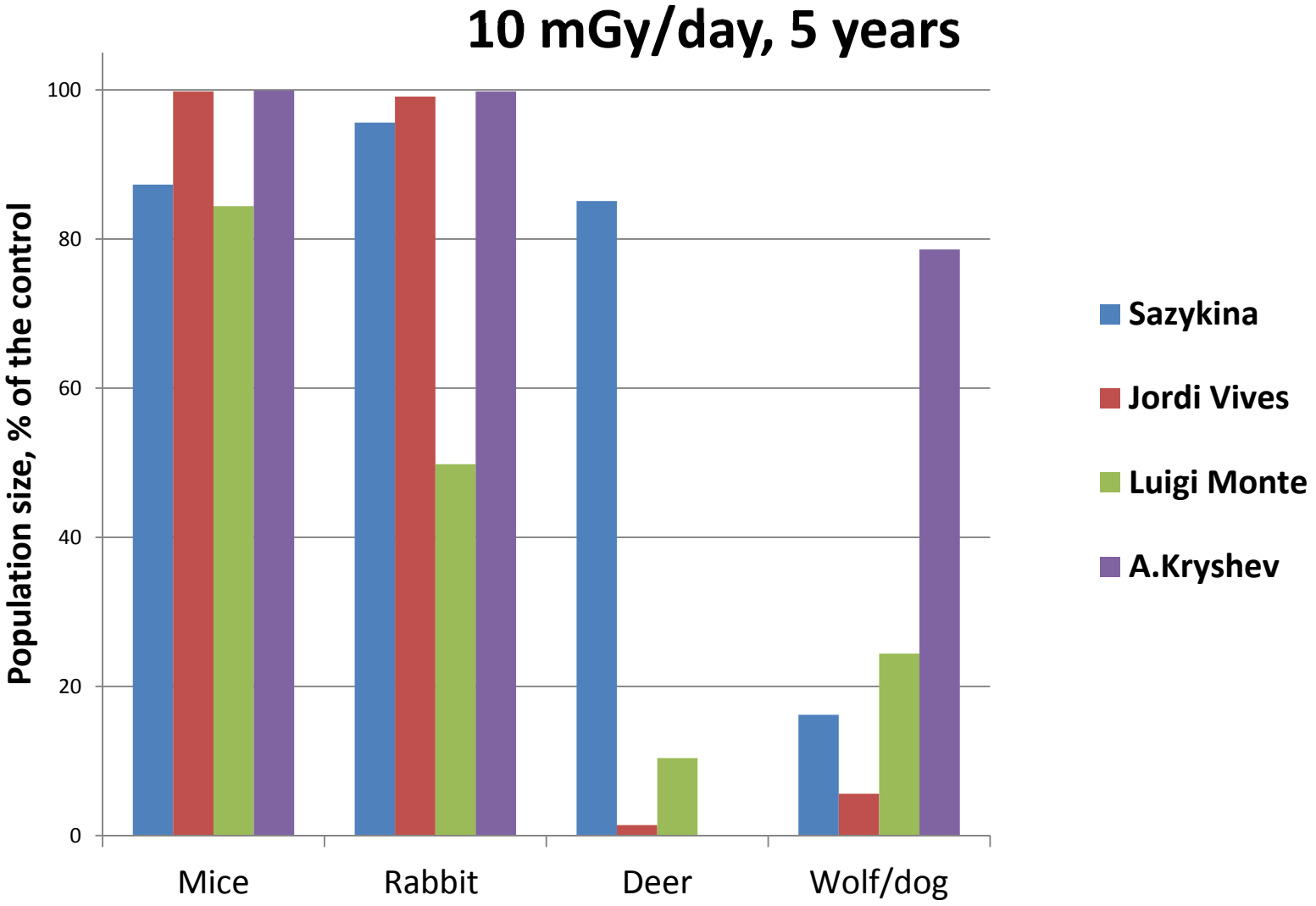
## Calculate the following benchmark endpoints:

- Size of each population, in % of the initial size for each dose rate. (Control population size=1000).

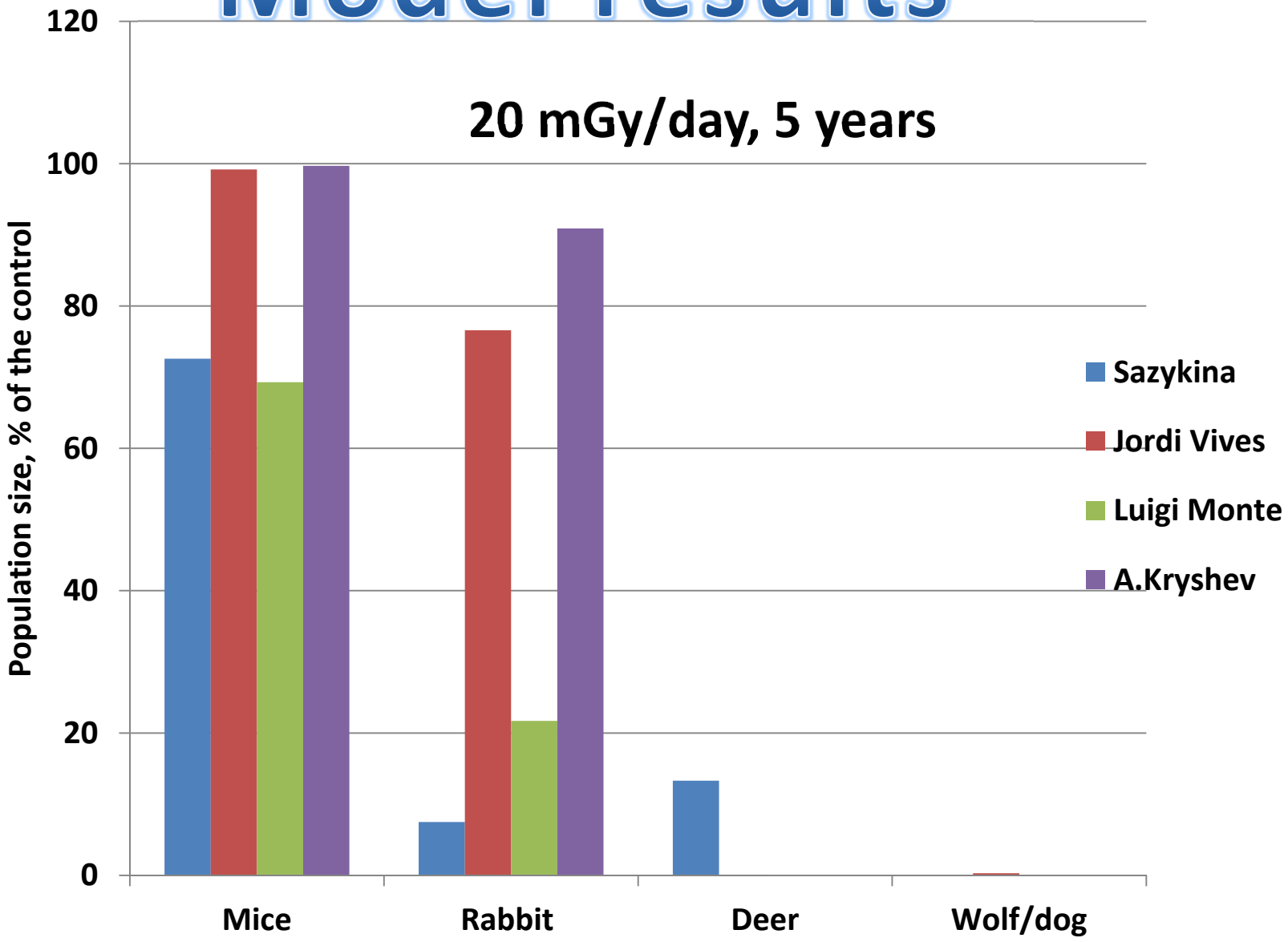
- Population size is predicted for the following time checkpoints: the end of $1^{st}$, $2^{nd}$, $3^{rd}$, $4^{th}$ and $5^{th}$ years of exposure;

- After the exposure was finished, calculate the time for recovery of populations to their initial size.

# Model results



# Model results



# Preliminary conclusions:

- Population survival of short-lived species is better than that of long-lived animals;
- Dose rates about 10 mGy/day for 5 years produced significant reduction of wolf/dog and deer populations; populations of mice and rabbits survived at 80-100% of the control.
-Dose rate 20 mGy/day for 5 years produced considerable reduction of all populations, excepting short-lived mice, which survived at levels above 70% of the control.