Participants of the sub-group "Population Models and Alternative Methods".

13-15 active participants from Belgium, France, Italy, Russia, Japan and other countries.

At the First EMRAS II meeting an activity timetable was developed for the years 2009-2011.

TASKS	Task Completion
3. Pop. Models and Alternative Methods	
3a. review existing population models	3a: July 2009 (Yes)
3b. develop generic population model for radiological assessment	3b: Jan. 2010 (in work)
3c. develop scenario for model application (e.g. exposure levels for 10% decrease in population)	3c:March 2010 (Started)
3d. develop life history data sheets	3d: Oct. 2010 (Started)
3e. explore alternative methods	3e: Dec. 2010
3f. run models, compare results	3f: July 2011
3g. reports; publications	3g: Sept. 2011

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 populations of

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

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.

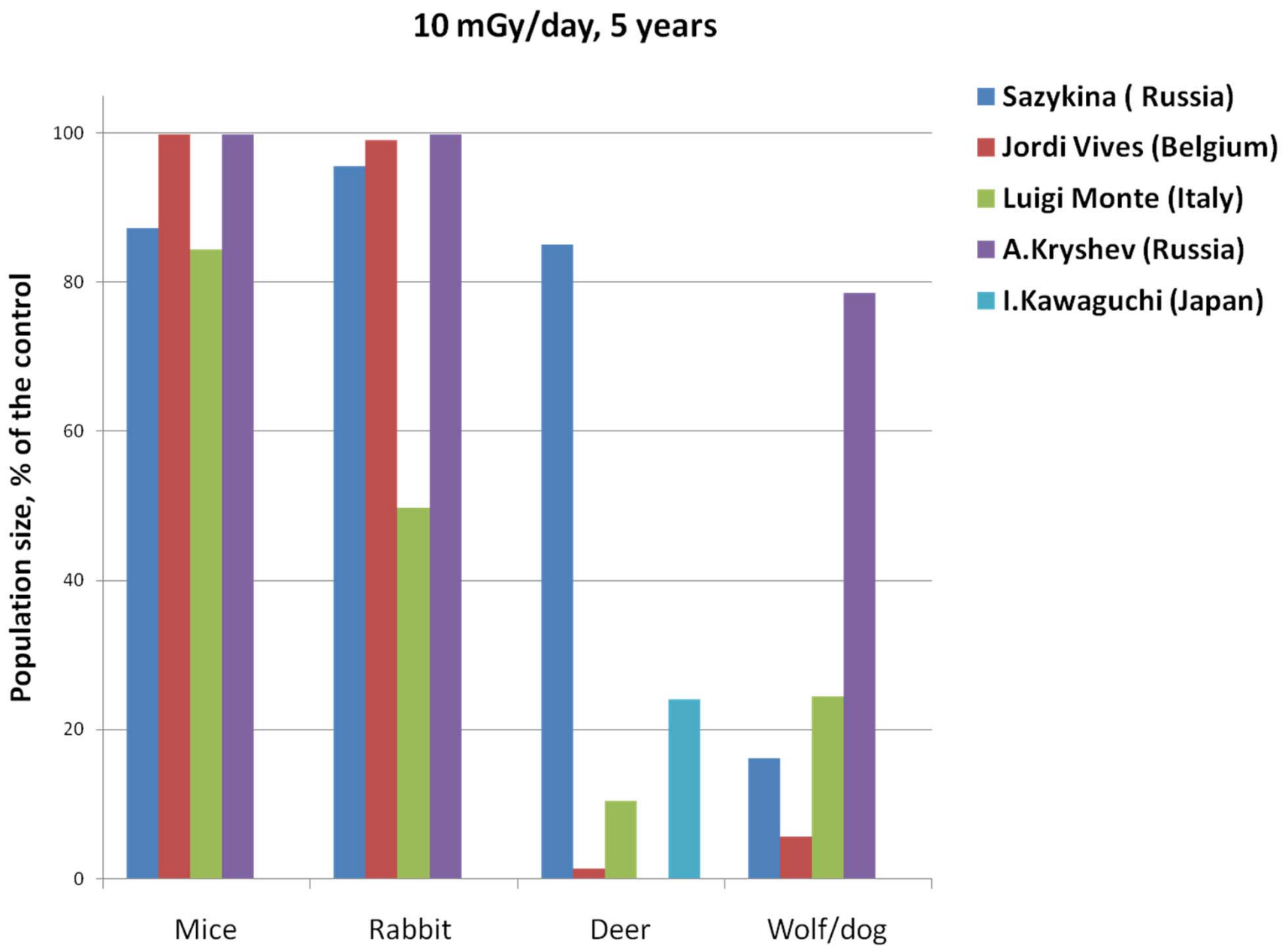
<u>Calculate the following benchmark endpoints:</u>

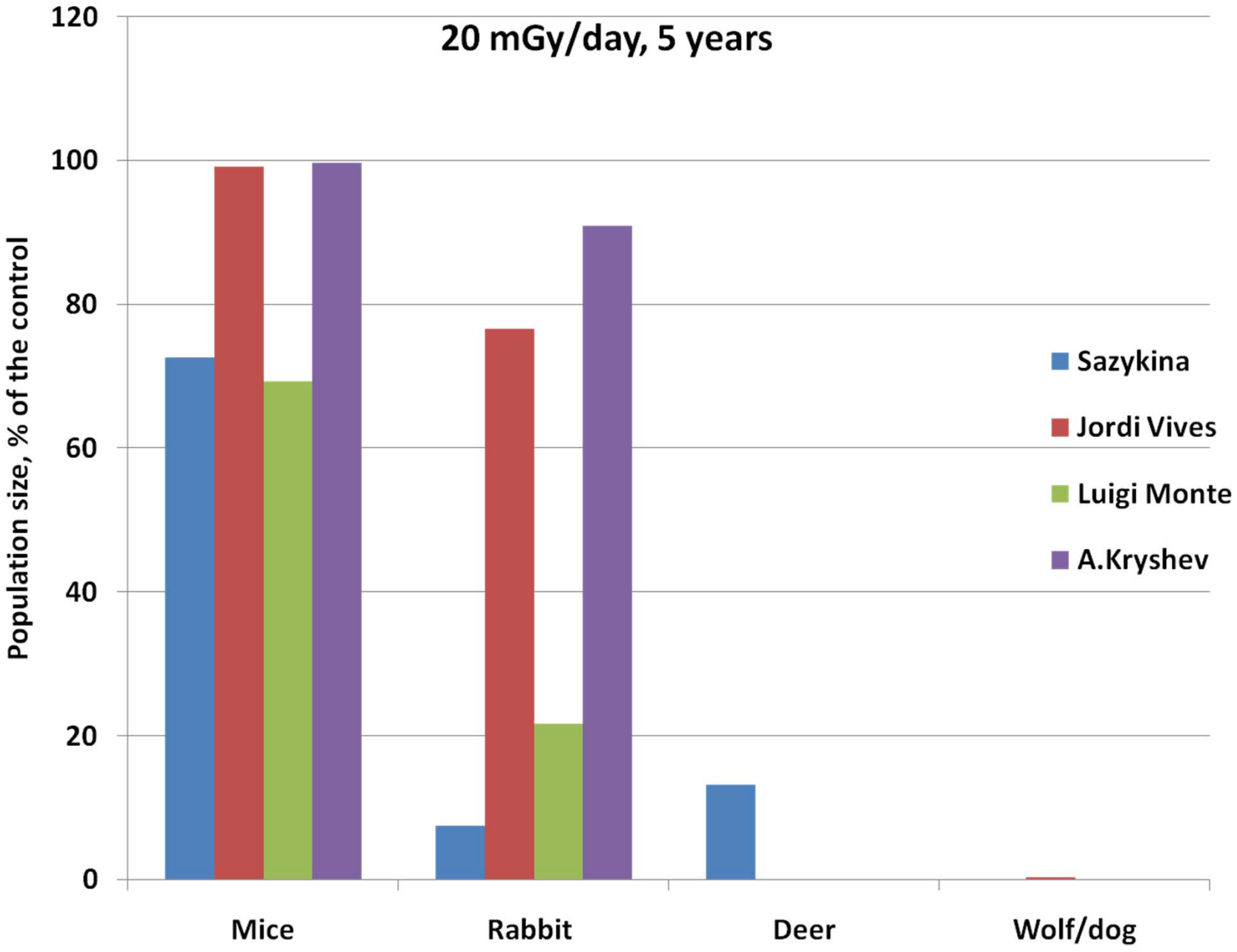
- **Size of each population, in % of the initial size for each dose rate for the following time checkpoints: the end of 1^{st}, 2^{nd}, 3^{rd}, 4^{th} and 5^{th} years of exposure;**

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

RESULTS OF CALCULATIONS ON THE BENCHMARK SCENARIO
”Population response to chronic irradiation”.:

The Benchmark scenario was formulated in Autumn of 2010.
Due to extraordinary high activity of participants, in January of 2011, five modelers completed the calculations on the scenario, and presented their results.
Now have a unique opportunity to see the first results of population effects modelling.


10 mGy/day, 5 years
Population size, % of the control
100
80
60
40
20
0
Mice
Rabbit
Deer
Wolf/dog
Sazykina (Russia)
Jordi Vives (Belgium)
Luigi Monte (Italy)
A.Kryshev (Russia)
I.Kawaguchi (Japan)


20 mGy/day, 5 years
Population size, % of the control
120
100
80
60
40
20
0
Mice
Rabbit
Deer
Wolf/dog
Sazykina
Jordi Vives
Luigi Monte
A.Kryshev

Preliminary results:

- 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.