

# Prognosis and scenarios of outdoor recreation

*Pouta, E., Neuvonen, M. & Sievänen, T.*

# Need for outdoor recreation forecasts

- Changing society
- Changing population
- Changing lifestyles
- Changing environment
- Science-based information needed for
  - Policy of use of natural resources
  - Planning and management of recreational areas
  - Policy of recreation service provision

# Approach

- three methods for predicting future recreation participation
  - 1) extrapolation of past trends
  - 2) regression techniques based on cross-sectional recreation inventory data
  - 3) scenario methods
- an opportunity for comparison and discussion

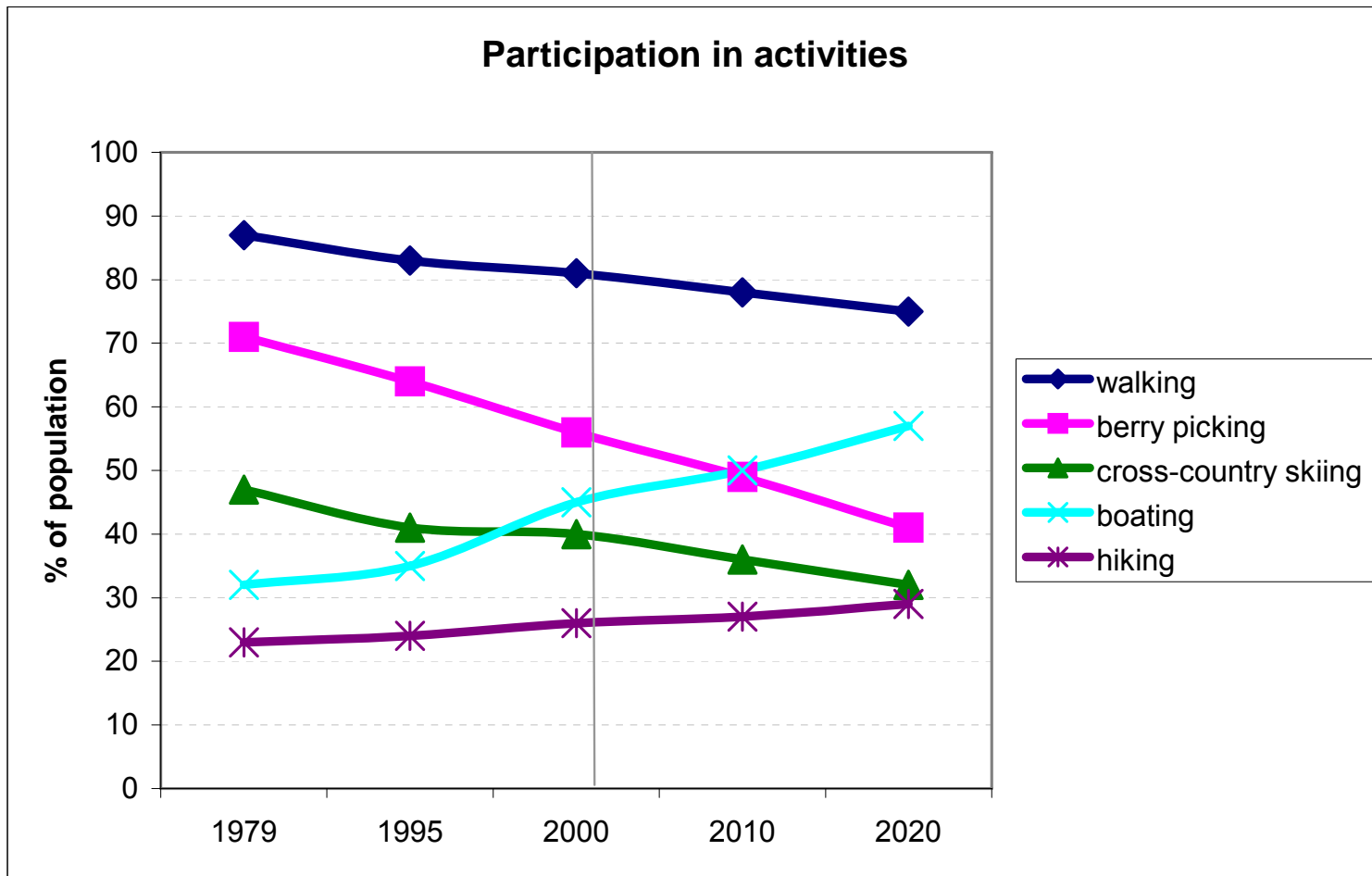
# Demographic and socio-economic trends

- ageing population
- increase in ...
  - level of education
  - percentage of white collar workers
  - difference between high and low income groups
- urbanization
- increase in ...
  - amount of leisure time
  - private consumption in leisure goods

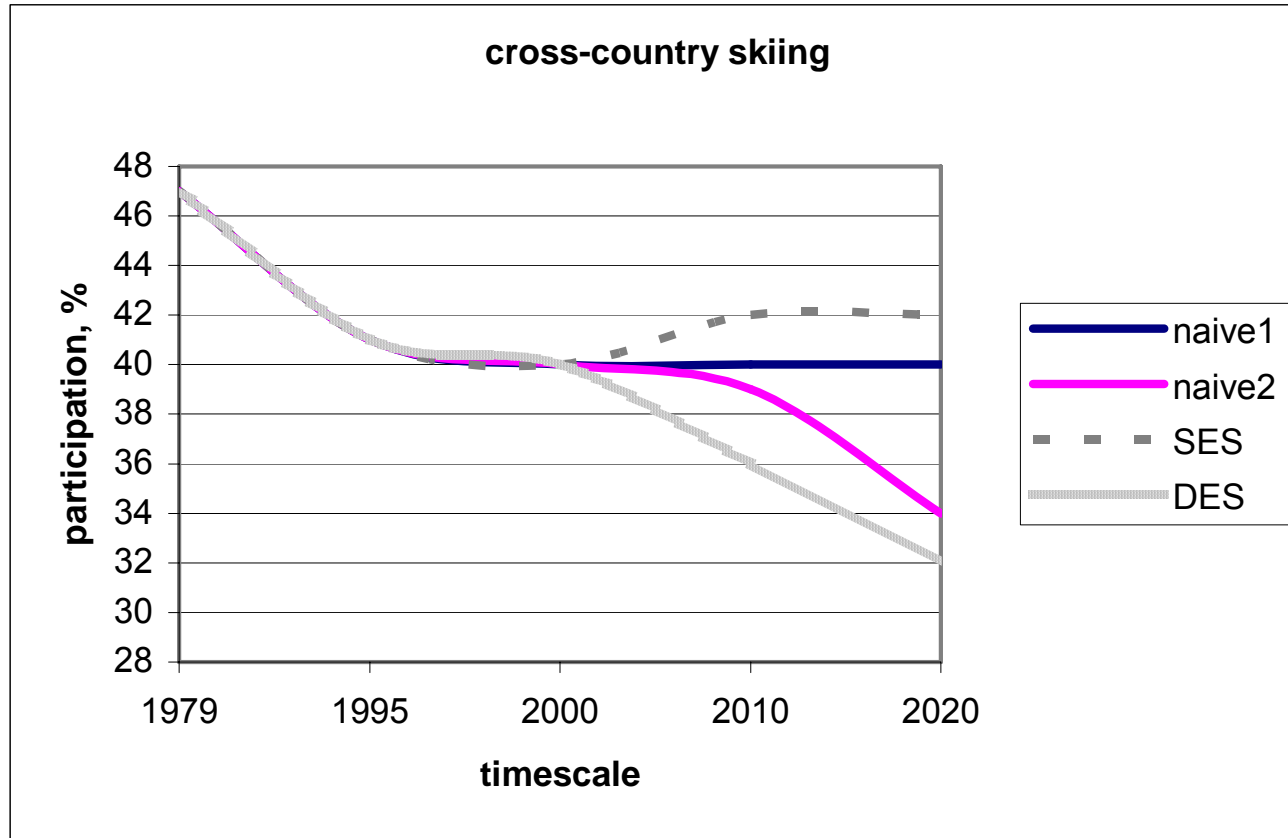
# Measurement of outdoor recreation

- Lack of time series
- Single measurements of participation in outdoor recreation:
  - Outdoor recreation survey, 1979 (Ministry of interior)
  - Reittiharrastaminen Suomessa, 1992 (METLA)
  - Time consumption (1979, 1987-88 and 1999-2000) and leisure time studies (1991, 2002) (Statistics Finland)
  - National Outdoor Recreation Demand Inventory (LVVI), 1998-2000 (METLA)

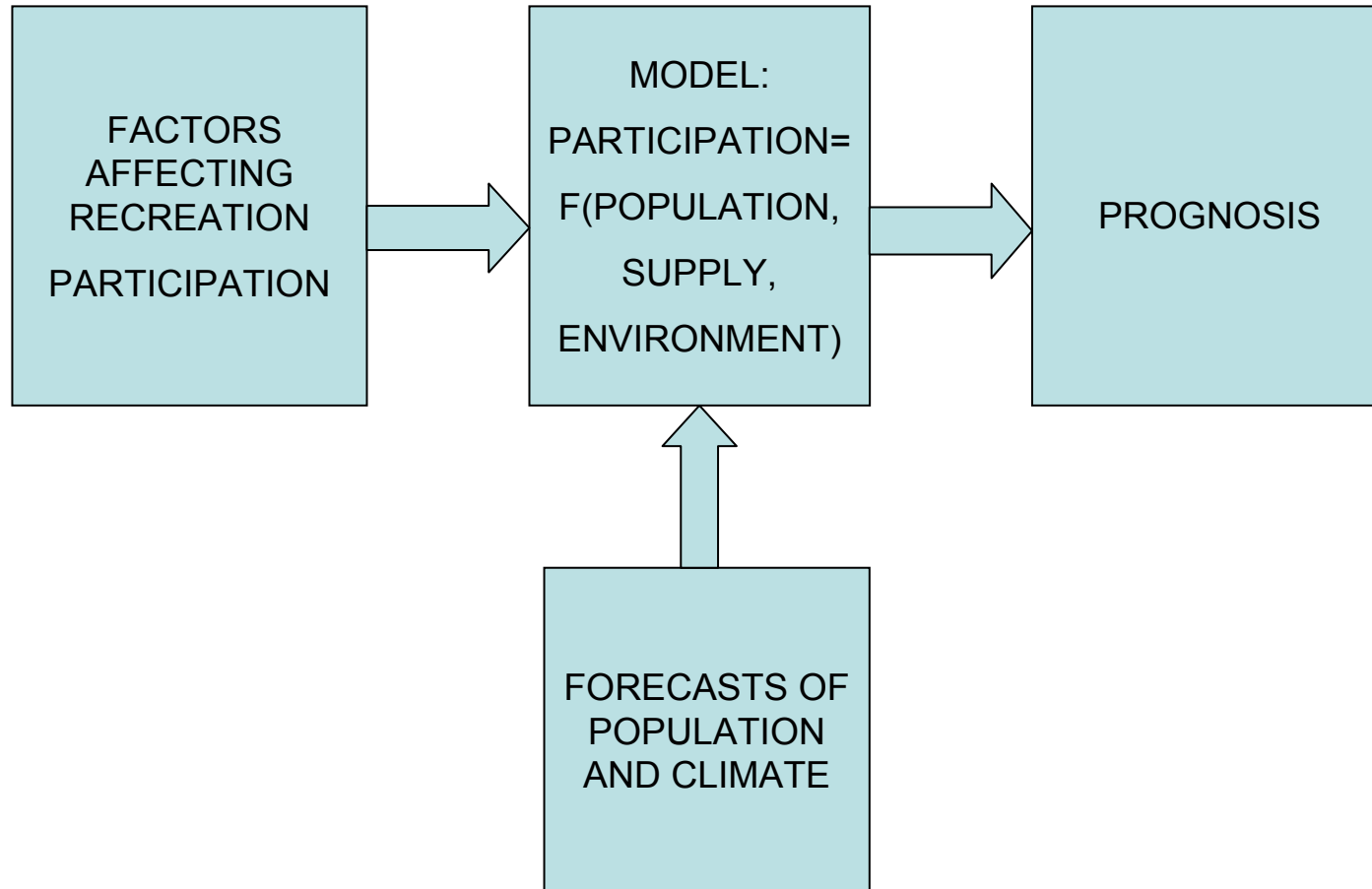
# METHOD 1: Extrapolation of past trends



# Alternative trends



## METHOD 2: Model based prognosis





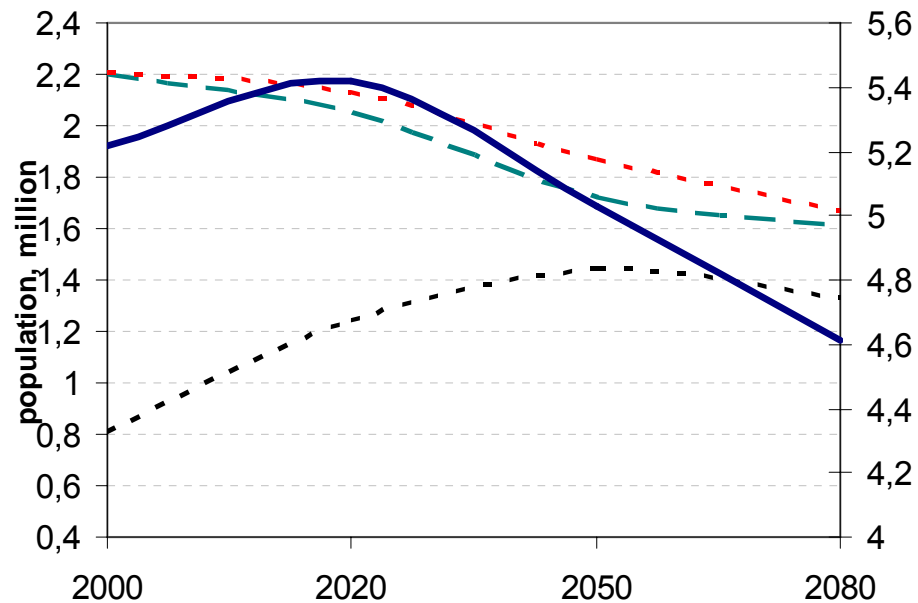
# Outdoor recreation models

- Data
  - Data from National Outdoor Recreation Inventory study (LVVI), n=10651
- Participation
  - Logistic regression
- Participation frequency
  - Count data models, Neg.Bin regression

# Information of demographic and socio-economic trends

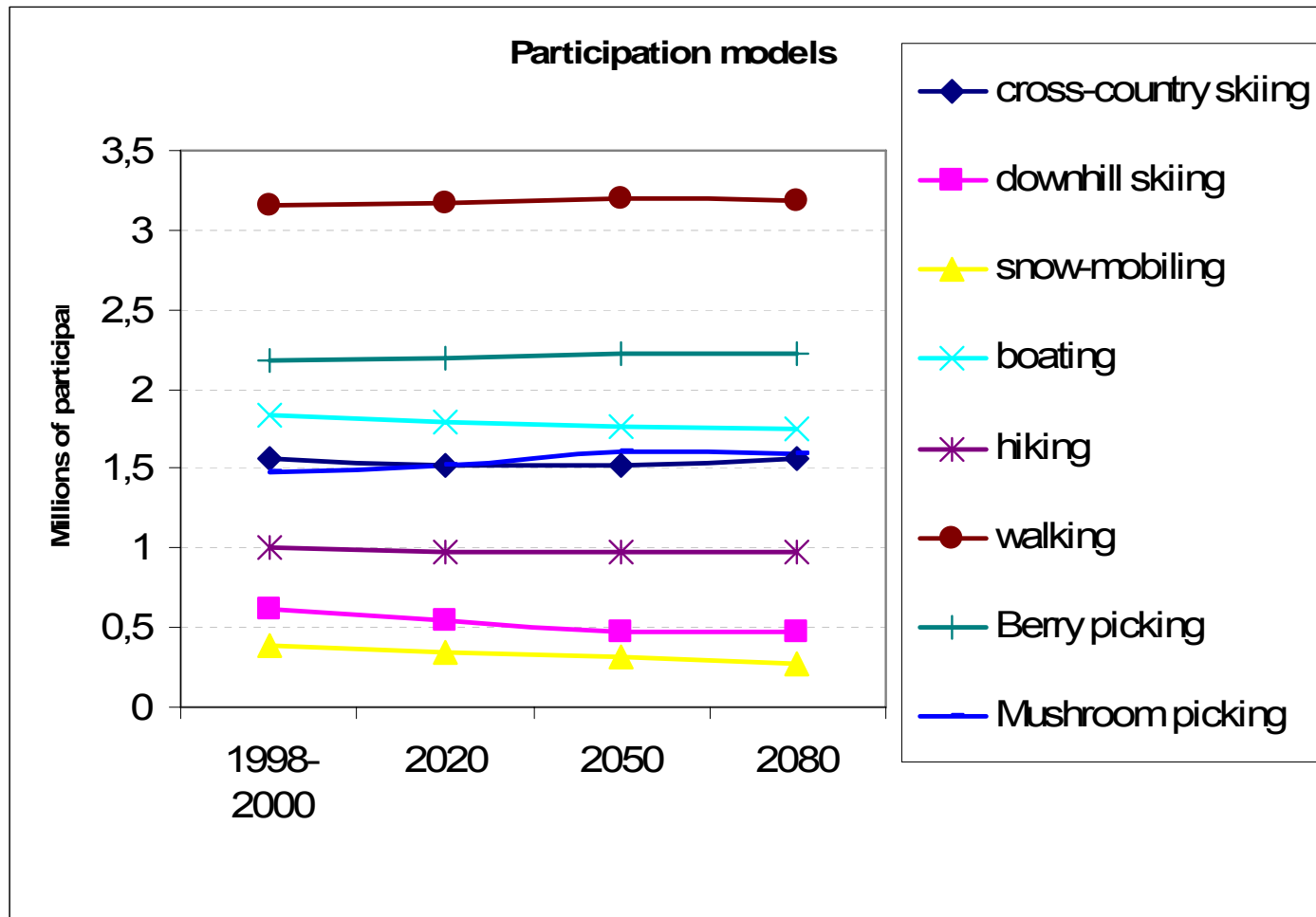
Variable	Assummed direction of change	Expected effect on outdoor recreation participation
Total population	↑(↓)	+ (-)
Age	↑	+/-
Education	↑	+/-
Percentage of employees	↑ (↓)	+ (-)
Percentage of urban population	↑	+/-
Leisure time private consumption	↑	+
Working time	↓	+

# Population forecast



- - - population 65+ years      - - - population 35-64 years  
- - - population 0-34 years      — Total Finnish population

# Participation forecast

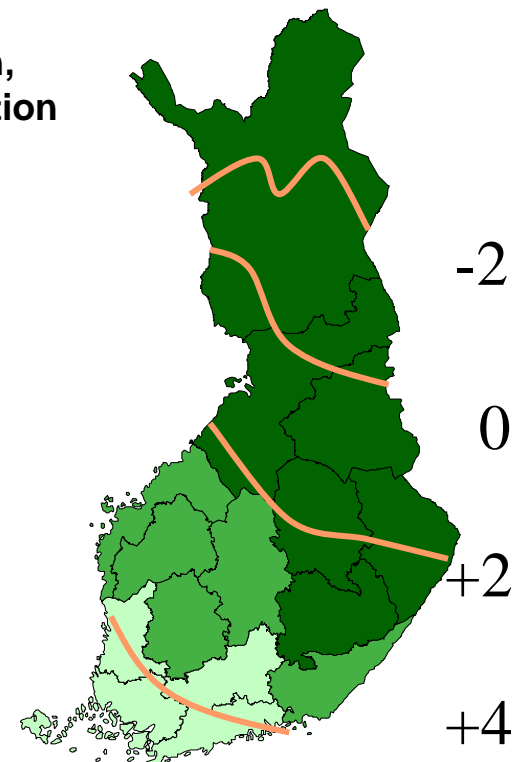
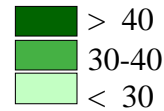


# Climate change -effect

- participation is dependent on climate
- e.g. cross-country skiing
- Building participation models with climate variables

## Cross-country skiing

Participation,  
% of population



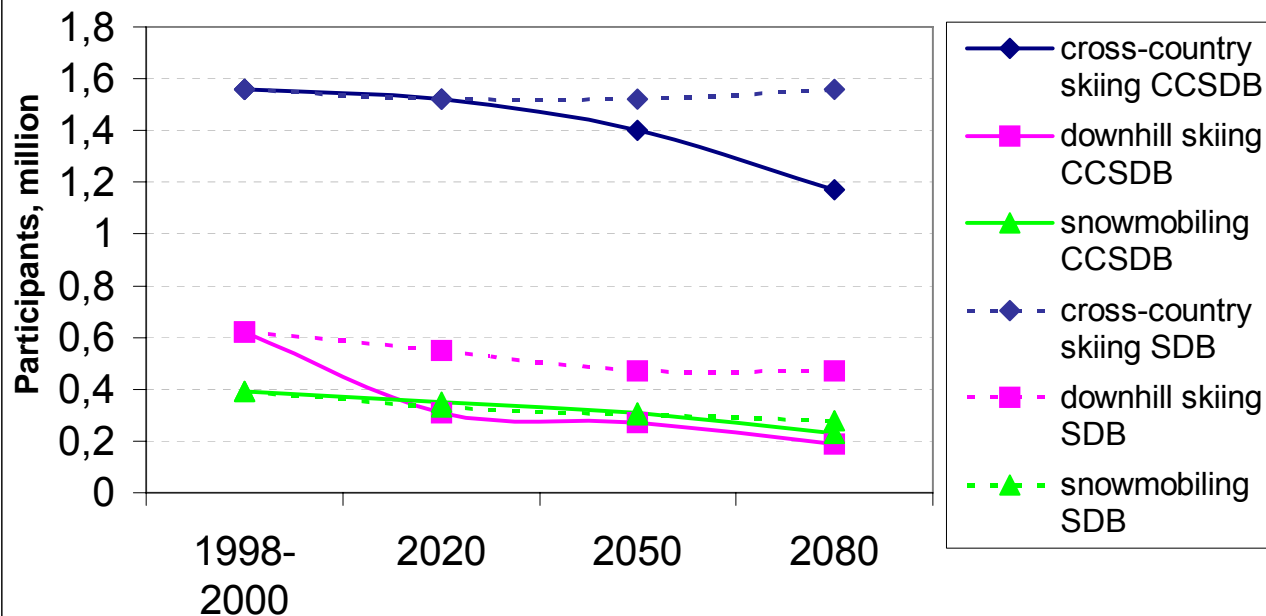
# Climate change -effect

**Based on participation models**

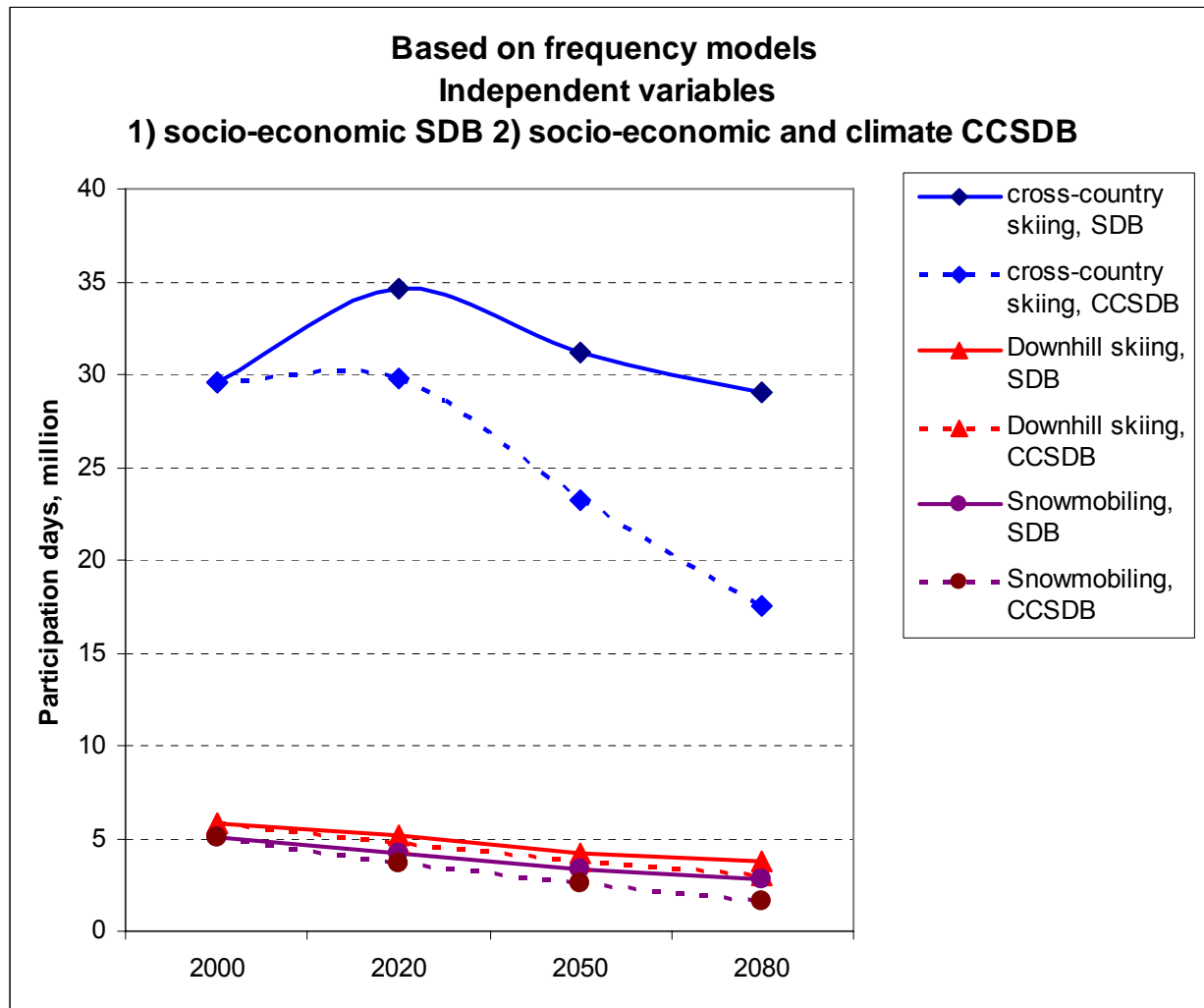
**Independent variables:**

**1) climate and socio-economic factors CCSDb**

**2) only socio-economic factors SDB**

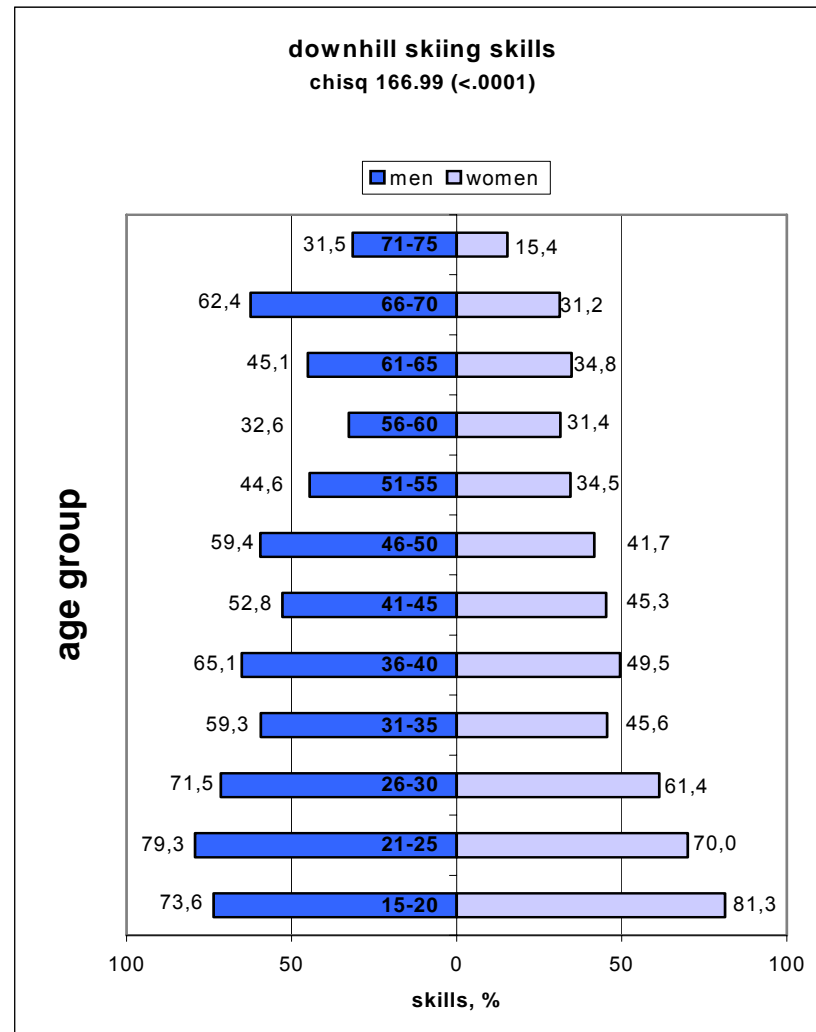


# Predicted change in participation times



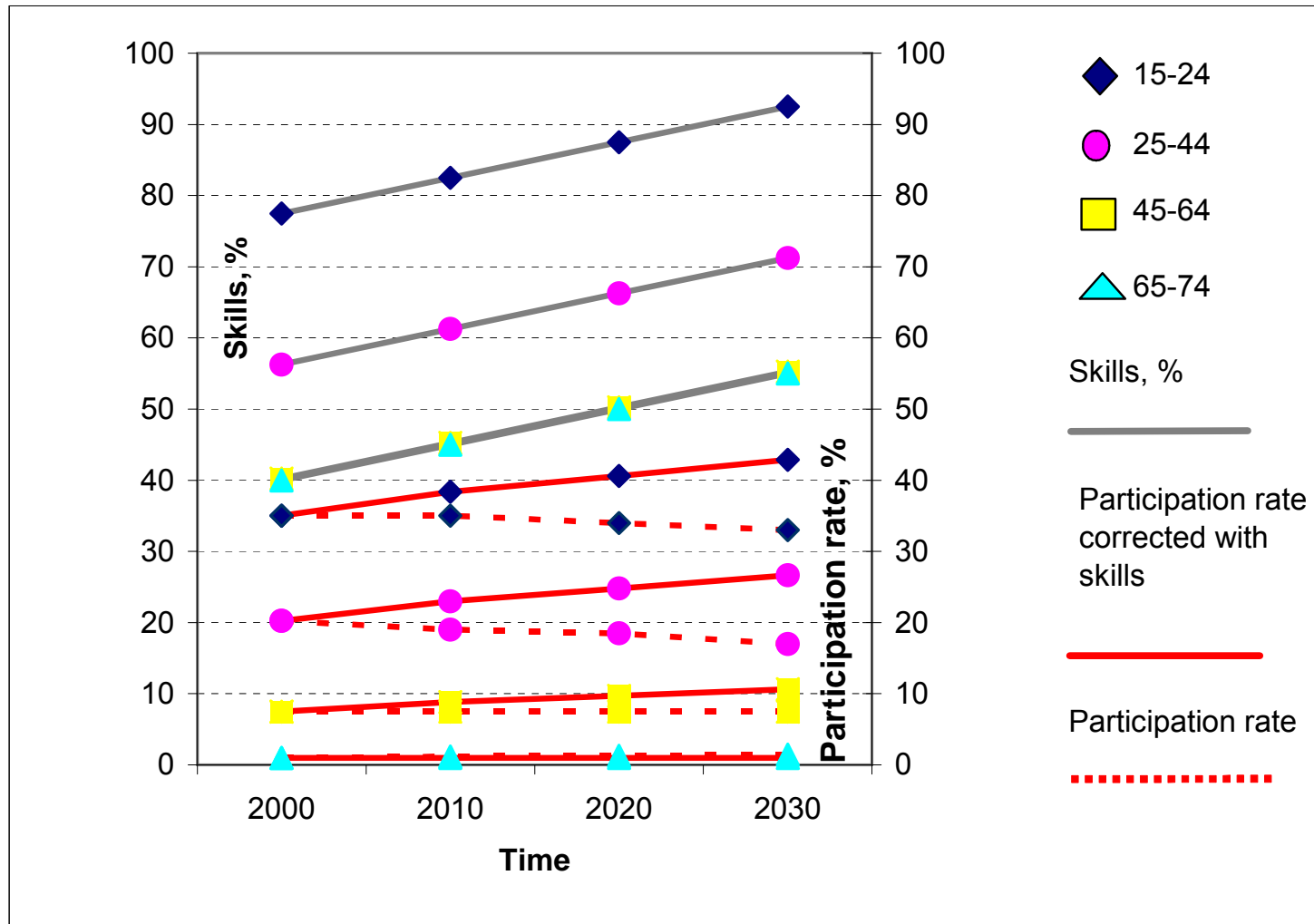
# Developing prognosis with information of skills

- Effect of cohort
- Measurement of recreation skills gives insight of cohort





# Example of cohort effect –downhill skiing



# METHOD 3: Recreation scenarios

## ■ Unified population

- \* more leisure time for everyone
- \* equal income
- \* whole country is populated

## ■ Divided population

- \* lack of leisure time in some population groups
- \* disparity in income
- \* population centralized in large cities

# Environmental values and attitudes

## Traditional

- Nature related and consumptive outdoor activities
- Natural environment is highly appreciated

## Modern

- Nature as recreational environment is replaced by built environment
- Natural environment has a function of stage or scene

# Scenario combination

## VALUES

Traditional,  
nature related

Technological,  
urban

## POPULATION

Divided

luxury nature  
activities, walks  
in near forest

virtual activities,  
"shopping  
centre walks"

Unified

spending time at  
vacation home  
fishing, hunting  
and hiking trips

motorised  
activities

# Alternative futures

	Model based estimation	Trends	Scenario/expert opinion
Walking			-
Cycling			
Jogging			-
Hiking, backpacking			
Hunting		-	
Fishing			
Berry picking			
Swimming in natural waters			
Boating			
Cross-country skiing			
Downhill skiing		-	

Color codes: **Stabile**, **Decrease**, **Increase**

# Future for outdoor recreation based on prognosis?

- Future seems rather stabile
- Ageing is one of the key factors
- Climate change has an effect on winter activities



# Discussion

- Different methods – different future alternatives
  - Combination of different future alternatives gives a better general view
- Need for methods of Future studies
- As the forecasting is difficult it is very essential to monitor participation
- Need for panel-data to identify the effect of age and generation



*THANK YOU!*