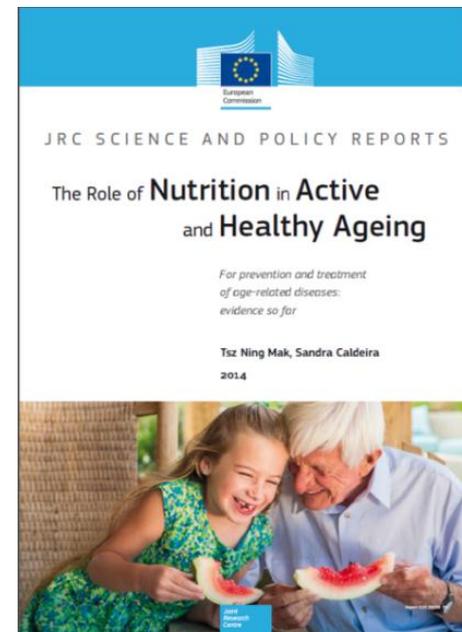


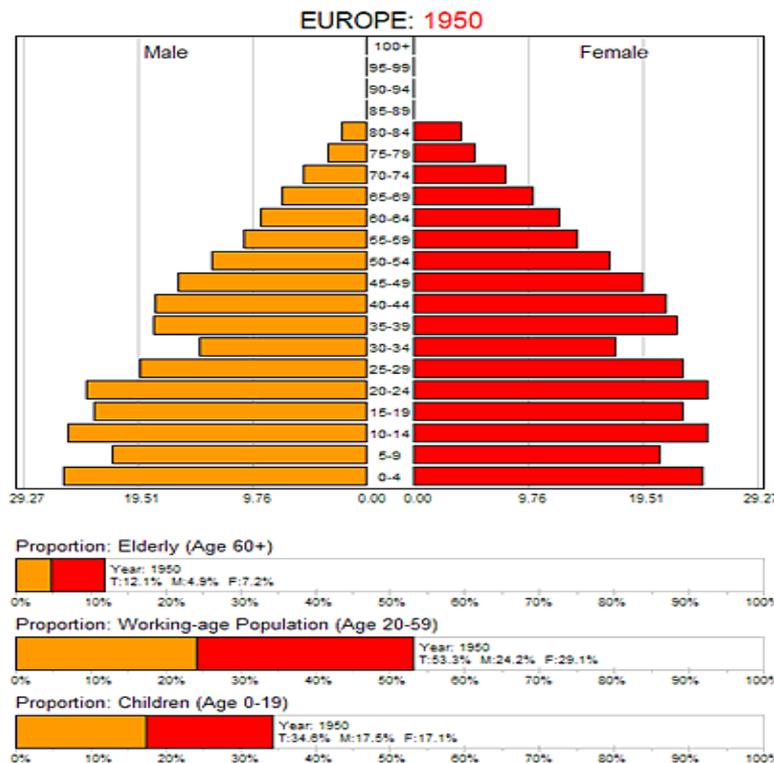
The role of nutrients in the prevention and treatment of age-related diseases

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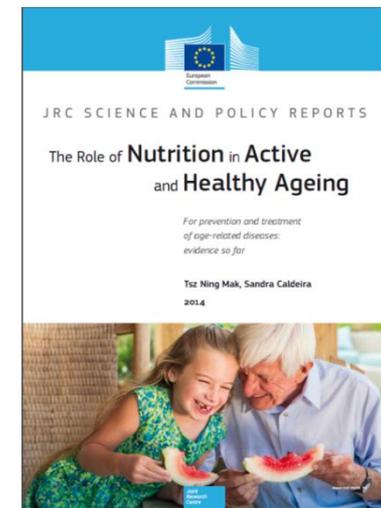
Background and aim



- Demographic ageing is a key societal and economic challenge in Europe.
- The Joint Research Centre (JRC), as the European Commission's in-house science service, aims to:
 1. Raise awareness of the importance of nutrition in ageing
 2. Encourage more attention being given to diet and nutrition in policymaking to protect our older citizens
 3. Support the aims of the European Innovation Partnership on Active and Healthy Ageing

Content of report

- The report aims to provide an overview of the role of nutrition (nutrients, whole diet approach, use of supplements) in promoting active and healthy ageing (AHA), in particular in preventing and treating age-related diseases and mortality
- Determinants of AHA
- Undernutrition and functional decline
- Key nutrients important for AHA
- Whole diet approach
- Future research directions



Undernutrition and functional decline

- Older people vulnerable to undernutrition - particularly protein, key micronutrients
- Functional changes related to the natural ageing process
 - Physical function: e.g. musculoskeletal, GI tract
 - Sensory changes: taste, smell, sight
 - Cognitive decline
 - Immune system
- Disease status and medications



The role of nutrients in AHA

- Water
- Macronutrients
 - energy intake, protein, fat, carbohydrates
- Micronutrients
 - Vitamins B6, 12, folic acid
 - Vitamin D & calcium
 - Antioxidants vitamins A,C,E
 - Minerals e.g. selenium, zinc
- Phytochemicals – catechins, resveratrol, other bioactives
- Probiotics, prebiotics
- (Whole diet approach – Mediterranean Diet)

} Age-related
diseases
prevention
and
treatment

Associations - key nutrients and diseases

Key nutrients	Deficiency association with
Protein	Low muscle protein synthesis; sarcopenia and osteoporosis
<i>N-3</i> fatty acids	Increased inflammation, oxidative stress; cognitive decline; bone & muscle health; rheumatoid arthritis
Vitamin D & calcium	Impaired musculoskeletal function – osteoporosis and sarcopenia; increased risk of fracture; CVD
Vitamin B6,9,12	Increased blood homocysteine levels, associated with Alzheimer's disease, dementia and CVD development
Antioxidants Vitamin A, C, E	Degenerative pathologies: cancer, autoimmune disorders, aging, cataract, rheumatoid arthritis, cardiovascular and neurodegenerative diseases
Antioxidant minerals Selenium and Zinc	Poor immune functions – increased inflammation and infection

Principles of evidence-based decision-making



National Diabetes Education Program, US

Mixed evidence from supplementation trials

Supplementation	Supportive	Not supportive
Protein & energy	Reduced mortality; weight gain	Functional improvement
Omega 3 fatty acids	Rheumatoid arthritis	Cognitive function and dementia prevention
Vitamin D & calcium	Vit D + calcium, hip fractures reduced	Vit D alone no effect on fractures risk
Vitamin B6,9,12	Multi B vit trials: inconsistent, but some positive on cognition	Single B vit no improvement on cognitive functions
Antioxidants Vitamin A, C, E		Eye diseases Cognition (MCI/ AD) CVD
Antioxidants Selenium and Zinc	Selenium: GI cancer; CVD and related mortality Zinc: Eye health; common cold	

Evidence on micronutrient supplementation

- Given the issue of undernutrition and micronutrient deficiency in older people, micronutrient supplementation could be a pragmatic approach to reduce the problem
- We reviewed the evidence on vitamin and mineral supplementation in prevention and treatment of age-related diseases and conditions
 - Cochrane reviews, recent systematic reviews & meta-analysis
- So far, inconsistent results observed among review studies
- Limited benefit is seen with single nutrient supplementation in older people to prevent or treat specific cognitive and functional impairments

Possible explanations for lack of effects

- Dosage of supplements between studies
- Duration of the interventions
- Unknown therapeutic window
- Variations in individual responses
- Study populations may not be at risk or undernourished

Whole diet approach

- Another approach to ensure proper nutrition in older people is to maximise their intake of essential vitamins and minerals from natural food sources
- Indeed, evidence so far on the Mediterranean Diet as a whole diet approach to promote health, increase longevity and reduce the risks of various age-related diseases supports this in a number of observational studies

Thank you for your attention!