

COST-EFFECTIVENESS STUDIES IN PRIMARY PREVENTION INTERVENTIONS TARGETING CHILDREN



EUROPEAN PUBLIC HEALTH CONFERENCE

WORKSHOP

DATE: NOVEMBER 11TH 2016,

TIME: 15.10 – 16.10

ROOM 1.86

VIENNA, AUSTRIA



Organized by EUPHA section Child and Adolescent Public Health and EUPHA section Public Health Economics

OBJECTIVES

Cross-sectional representative surveys and school entrance examinations in different European countries have shown that an increasing proportion of preschoolers exhibit health-related issues with potential long-term negative consequences. These health problems (e.g. obesity, attention deficit hyperactivity disorder, social-emotional problems) affect health and quality of life in adulthood. In addition to effects on future health, these issues may have broader implications that impact both future health care costs and economic productivity.

Efforts to prevent these problems in children have increasingly been implemented in childhood everyday settings such as schools and neighborhoods. In addition, more and more interventions envision promoting children's health at even earlier points in development including pregnancy. Early childhood might be ideal for interventions to be cost-effective as health behaviors are yet to be firmly established.

However, most of the interventions are only evaluated regarding their health-related effects and not their costs. To enable effective political decision-making, cost-effectiveness estimates will be valuable in strengthening the case for early preventive efforts. Therefore, this workshop focuses on cost-effectiveness analyses that evaluate short and long-term economic consequences of early prevention programs. We will also discuss how economic parameterization and evaluation could be used to advance the field of early prevention.

MAIN MESSAGES

- ✘ Increasing the awareness of health care and policy organizations on health economic aspects of childhood interventions and consequences on the design of early prevention programs.
- ✘ Translation into effective and sustainable public child programs in order to cut the rising costs of health care and advance health promotion of children in future.

LAYOUT OF THE WORKSHOP

Starting with a systematic literature review (presentation 1) demonstrating the need for cost-effectiveness analyses of childhood interventions, the workshop focuses on studies analyzing the cost-effectiveness of exclusive early prevention programs in Europe. In detail, costs and benefits of an obesity prevention program in Portugal to increase healthy eating and active life as one representative European country will be presented (presentation 2). Afterwards, the workshop broadens the time horizon to long-term consequences and focuses on long-term benefits and cost of primary obesity prevention in Sweden (presentation 3). Since the use of conventional cost-effectiveness analyses (as discussed in presentation 2 and 3) cannot address the complexity of childhood interventions, the workshop discusses alternative approaches in the field of childhood interventions (presentation 4).

CHAIRPERSON FOR THE WORKSHOP



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PROGRAM

Introduction 15.10 – 15.15

Presentation 1 15.15 – 15.25: Cost-benefit analysis of the 'Planning Health in School' programme to prevent children's obesity

Presentation 2 15.25 – 15.35: Cost-effectiveness of obesity prevention in early childhood: A systematic literature review

Presentation 3 15.35 – 15.45: Economic evaluation of an early childhood intervention to prevent obesity: the Primrose study

Presentation 4 15.45 – 15.55: Cost-effectiveness analyses as a facilitating tool for decision making: An illustration with vaccine preventable diseases in early childhood

Discussion and closing 15.55 – 16.10

PRESENTATION 1: 15.15 – 15.25

COST-BENEFIT ANALYSIS OF THE 'PLANNING HEALTH IN SCHOOL' PROGRAMME TO PREVENT CHILDREN'S OBESITY

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Authors: M Vieira, GS Carvalho

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Background: This study evaluates the cost-benefits of the 'Planning Health in School' programme (PHS-pro), which was implemented for one-year in a follow-up non-randomized parallel-group trial that promoted healthy eating and active living in Portuguese children of 10-14 years.

Methods: Anthropometric outcomes (height, weight, waist circumference- WC, BMI and waist-height-ratio- WHtR) and behaviour changes in 219 intervention children (IC) were compared to 230 controls children (CC). A standard economic evaluation was used to determine the cost-benefits of the intervention, following the societal perspective approach. PHS-pro intervention costs were estimated and compared to the direct costs of treating obese adults in Portugal based on a Portuguese study (Ribeiro V. 2010). The net benefit was measured by subtracting the delivery costs of the intervention per child from the total averted medical costs associated to treat an adult obese in Portugal.

Results: After PHS-pro, the IC grew significantly more than the CC ($p < 0.001$), the WC was significantly lower in the IC (-0.4 cm) whereas CC increased (+0.3 cm; $p = 0.015$), and the WHtR of IC showed a significant reduction ($p = 0.002$) compared with CC. PHS-pro costs were estimated in € 8123.38 with an average intervention cost of €37.09/child to attend to the programme. This is much lower than the average direct costs for treating an adult obese in Portugal which was calculated in €3849.15/year. These costs are equivalent to implementing the PHS-pro in 104 children. The PHS-pro net benefit was positive in €3812.06 as the monetary benefits clearly overcame the monetary costs.

Conclusions: The findings provided evidence that the PHS-pro cost-benefits were economically feasible. The PHS-pro can be of beneficial investment to prevent overweight over in childhood and adolescence, developmental stages that determine adulthood free of chronic diseases.

Main messages:

1. The PHS-pro improved effectively children's anthropometric outcomes with a intervention cost of 37.09 per child, much lower than the direct costs for treating an adult obese in Portugal.
2. The PHS-pro can be a monetary beneficial investment to prevent obesity over childhood and adolescence.

PRESENTATION 2: 15.25 – 15.35

COST-EFFECTIVENESS OF OBESITY PREVENTION IN EARLY CHILDHOOD: A SYSTEMATIC LITERATURE REVIEW



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Background: Despite methodological advances in economic modelling, the application of cost-effectiveness studies in primary prevention intervention targeting children is clearly underutilized. The aim of the present study was to explore existing methods and applications of cost-effectiveness studies within early childhood obesity prevention.

Methods: A systematic literature review was conducted using the main electronic data bases for health sciences and health economic evaluations including PubMed, Cochrane Library and EconLit. Peer-reviewed full economic evaluations published in English or German between January 2004 and November 2015 were considered for review. Eligible were studies which included either a trial-based cost-effectiveness or a simulation-based cost-effectiveness analysis of an obesity prevention targeting pre-school child and/or their parents.

Results: Of the 728 studies identified in the initial search, 714 were excluded after screening based on titles and abstract. Among remaining eleven articles, six studies were in line with our eligibility criteria and were included for synthesis. Among them were five intervention studies, of which three were (cluster-) randomized trials and one was quasi-experimental intervention study. One study was based on a simulation study based on secondary data. The descriptive quality assessment of the included economic evaluations presented varying degrees of integrity and completion.

Conclusions: The demand for cost-effective childhood obesity prevention intervention is immense. Yet, the application into practice is lacking. The challenges for economic evaluations within the field of Public Health and especially childhood obesity results in that the majority of included economic evaluation did not follow the state-of-the-art methodology and may therefore provide only limited informative value for policymakers.

Main messages:

1. Despite the ever-growing number of childhood obesity intervention studies, economic evaluations remain to be rarely performed.
2. A new conceptual approach on the evaluation of the cost-effectiveness of childhood interventions is urgently needed.

PRESENTATION 3: 15.35 – 15.45

ECONOMIC EVALUATION OF AN EARLY CHILDHOOD INTERVENTION TO PREVENT OBESITY: THE PRIMROSE STUDY

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Background: Childhood obesity is a major public health concern. Given the individual and societal consequences of childhood obesity, decision-makers are in need of cost-effective prevention strategies. The aim was to assess cost-effectiveness of a novel primary prevention program targeting pre-school children attending child health centers (CHC).

Methods: PRIMROSE is a cluster-randomized controlled trial aiming to establish healthy eating and physical activity among preschool children (9-48 months of age) through motivational interviewing applied by trained nurses at CHC in Sweden. The primary outcome of the trial is BMI at age 4. First, intervention effects on children at age 4 will be extrapolated to age 18 based on existing longitudinal data. Second, lifetime impact on health and costs will be estimated using a simulation model from age 18 to convert BMI units into quality adjusted life years (QALYs) saved. The incremental cost effectiveness ratio will be estimated.

Preliminary results: The mean total costs of the PRIMROSE intervention was 4067 SEK (1226; 7084) per child. During preschool years direct costs mainly consist of training costs and costs for the additional time used by CHC nurses to implement the intervention compared to usual care. Early indirect costs mainly consist of parents' absence from work due to their participation in the intervention. In midlife use of medical care for obesity generates increasing direct health care costs and productivity losses due to sick leave, disability pension and premature mortality.

Conclusion: This health economic evaluation may provide further evidence that small intervention effects in childhood have considerable long-term economic consequences, particularly in adulthood, and that interventions implemented early in childhood result in higher return on investments per child compared to interventions later in life.

Main messages:

1. This economic evaluation is among the firsts in Europe evaluating an early childhood obesity prevention intervention.
2. This economic evaluation may provide information on effect size needed to get lower costs per QALY by the current intervention than by 'usual' primary obesity prevention at CHCs.

PRESENTATION 4: 15.45 – 15.55

**COST-EFFECTIVENESS ANALYSES AS A FACILITATING TOOL FOR DECISION MAKING:
AN ILLUSTRATION WITH VACCINE PREVENTABLE DISEASES IN EARLY CHILDHOOD**

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President of the EUPHA section on Public Health Economics.

Background: There have been a number of epidemics affecting infants and young children across Europe these past years (measles, polio, rubella, etc.). Most of the new infections in the population could have been avoided if the existing vaccines were administered in the communities. The information provided by public health experts doesn't seem to be convincing enough for authorities to implement the vaccination recommendations in the population. Since the mid-20th century, economic evaluations have been used to determine the optimal allocation of resources in different fields (education, road traffic safety, etc.), the use of economic evaluations have also been extended to the health sector. This presentation will focus on how economic evaluation can complement traditional epidemiological studies and contribute to facilitate the decision making process.

Methods: There are different methodologies for economic evaluations, there is a growing literature that successfully addresses the monetary quantification of the overall impacts of adverse health risk factors and public health interventions. The focus here is on cost-effectiveness analyses of vaccine preventable diseases in early childhood. A systematic literature review has been performed using the main electronic data bases for health sciences and health economic evaluations including PubMed, Cochrane Library and EconLit.

Results and Conclusions: Economic evaluations may contribute to enhance the effectiveness of decision making by providing information on optimal allocation of resources. In times of austerity, economic evaluations help to determine the most effective strategies and as such set priorities. However, it is essential to adopt a multidisciplinary approach in order to develop a more robust and comprehensive framework for health assessment in the decision making process.

Main messages:

1. Economic evaluations may contribute to enhance the effectiveness of decision making by providing information on optimal allocation of resources.
2. A multidisciplinary approach is needed in order to develop a more robust and comprehensive framework for health assessment in the decision making process.