



Department of Physical and Rehabilitation Medicine with the postgraduation course

**Medical prevention -
basic concepts, definitions.
Forms and methods of preventive work**

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Year 2022

The aim of the lecture

To inform 1-st year students about basic concepts and definitions of medical prevention, its forms and methods.

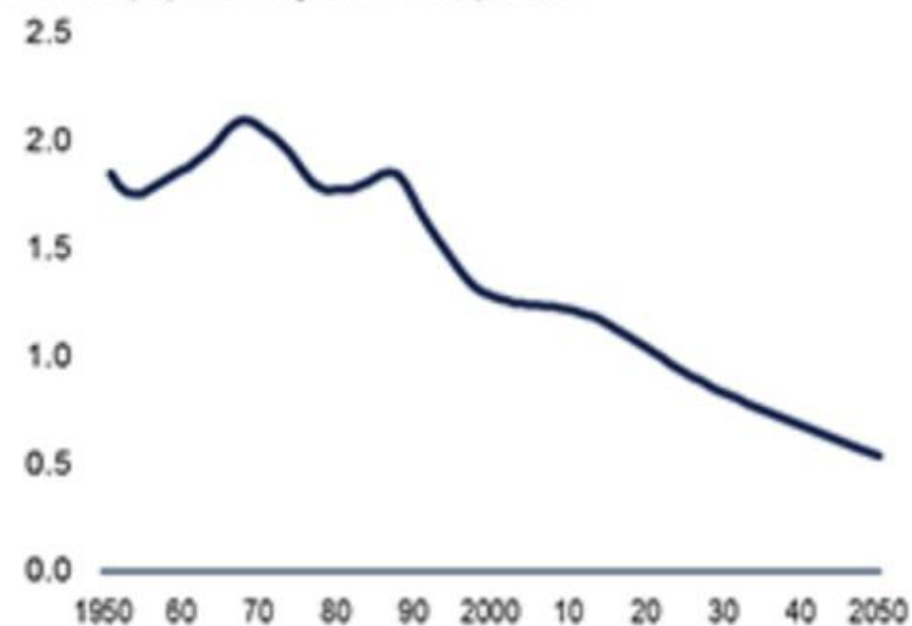
Lecture Plan

- Definition of such concepts as 'prevention', 'medical prevention', 'pre-existing disease', 'disease'.
- Primary, secondary, tertiary prevention
- Primary prevention and forms of work
- Secondary prevention and forms of work
- Social marketing
- Stages of effective social marketing

Figure 1 Global demographic trends are at an inflection point

a. An unprecedented period of global population growth has ended

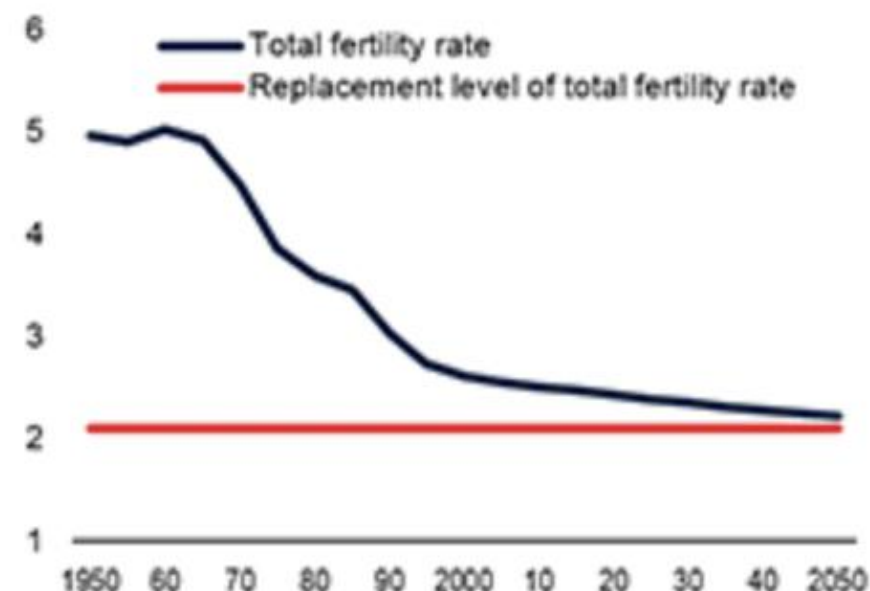
Annual population growth rate, percent



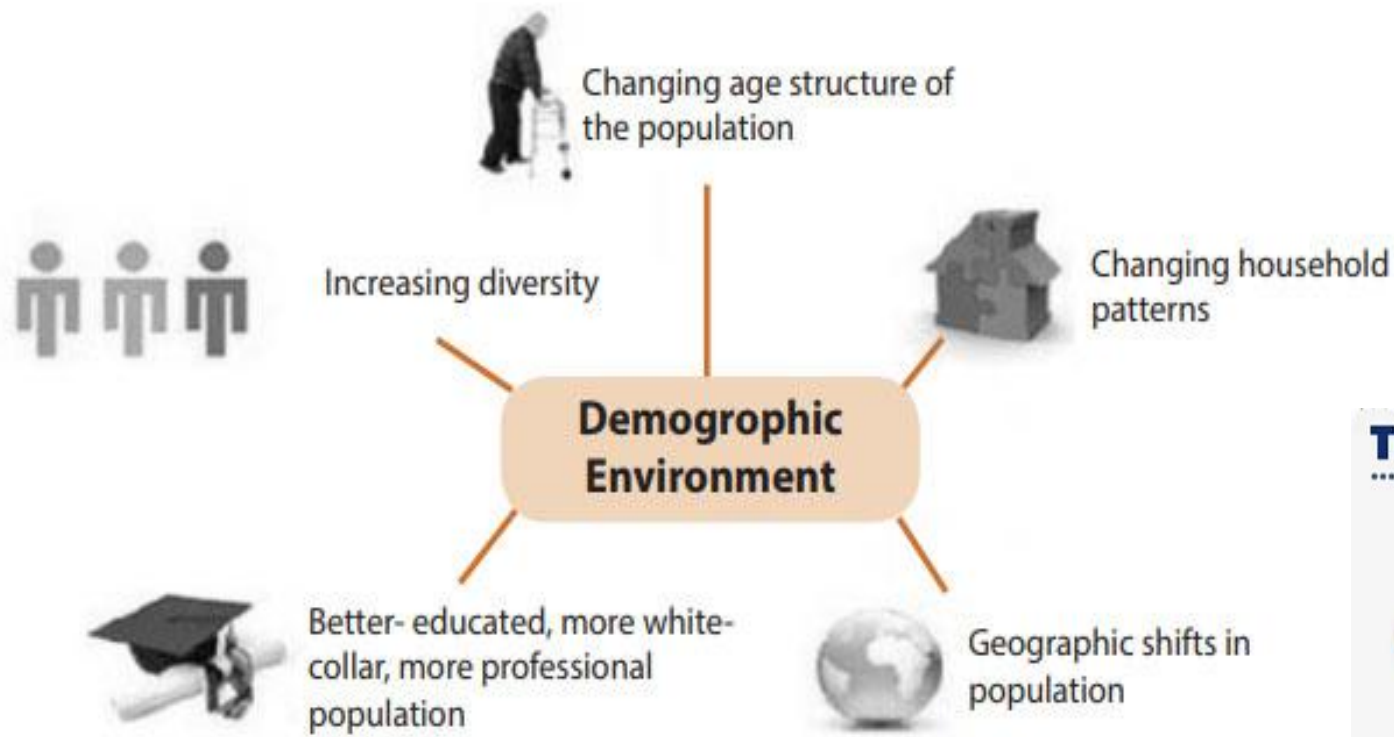
b. The global total fertility rate declined rapidly between the 1960s and 1990s

Number of births per woman

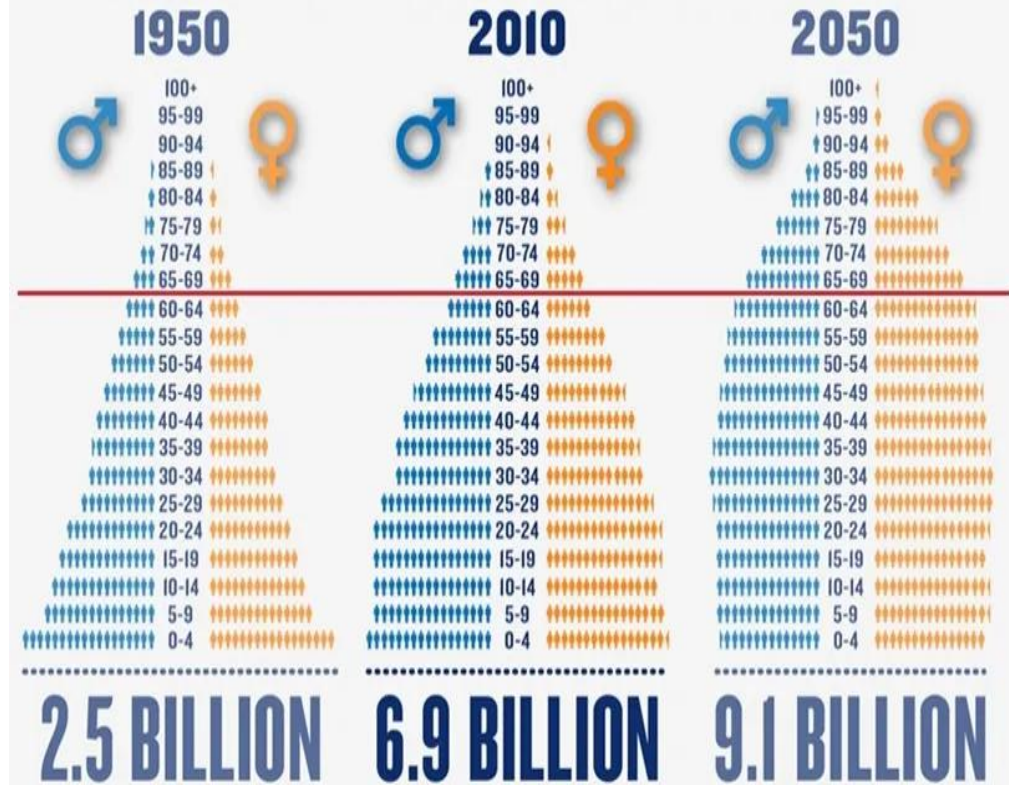
Legend



Source: Global Monitoring Report 2015/2016



THE WORLD'S CHANGING DEMOGRAPHIC PROFILE



What is the “demography” and what for we need to use it?

- Demographics is about the characteristics of the population in a specific area and includes multiple factors like age, race, income, etc. Further, most businesses find the data with respect to these factors within the targeted demographic variable of interest as it can affect the growth and success of a business.
- For example, India has around sixteen percent of the world's population and is second to China. Also, India has a relatively younger population compared to China. Therefore, many international companies are targeting India as a potential market for various products/services.

<https://www.worldometers.info>


WORLD POPULATION

| | |
|---------------|---------------------------------|
| 7,935,877,157 | Current World Population |
| 32,220,853 | Births this year |
| 365,665 | Births today |
| 13,527,086 | Deaths this year |
| 153,515 | Deaths today |
| 18,693,767 | Net population growth this year |
| 212,150 | Net population growth today |

FOOD

| | |
|----------------|---|
| 859,462,901 | Undernourished people in the world |
| 1,724,854,653 | Overweight people in the world |
| 805,366,384 | Obese people in the world |
| 29,204 | People who died of hunger today |
| \$ 589,021,134 | Money spent for obesity related diseases in the USA today |
| \$ 180,526,765 | Money spent on weight loss programs in the USA today |

HEALTH

| | | | |
|-------------------|--|---|------------|
| 2,985,577 | Communicable disease deaths this year | | |
| 114,183 | Seasonal flu deaths this year |  | Can change |
| 1,748,115 | Deaths of children under 5 this year | | |
| 9,821,509 | Abortions this year |  | Can change |
| 71,085 | Deaths of mothers during birth this year | | |
| 43,504,536 | HIV/AIDS infected people | | |
| 386,616 | Deaths caused by HIV/AIDS this year |  | Can change |
| 1,888,834 | Deaths caused by cancer this year |  | Can change |
| 90,692 | Deaths caused by malaria this year | | |
| 14,460,324,834 | Cigarettes smoked today | | |
| 1,149,694 | Deaths caused by smoking this year |  | Can change |
| 575,210 | Deaths caused by alcohol this year |  | Can change |
| 246,622 | Suicides this year |  | Can change |
| \$ 92,004,515,786 | Money spent on illegal drugs this year | | |
| 310,454 | Road traffic accident fatalities this year | | |

Disease prevention

- is the system of medical and non-medical measures, aimed at preventing, reducing the risk of developing health and diseases deviations, preventing or slowing their progression, reducing their adverse effects.

Medical prevention

- is the system of preventive measures health authorities and institutions.



Prevention Strategies

1. Population strategy – influence on those lifestyle and environmental factors that increase the risk of cardiovascular diseases in the entire population
2. High risk strategy – identifying and reducing risk factor levels in people with high risk of developing cardiovascular diseases
3. Secondary prevention - prevention of cardiovascular diseases progression

Primary



is a set of medical and non-medical measures aimed at preventing the development of health deviations typical to entire population

Secondary



is a complex of medical, social, sanitary-hygienic and psychological measures aimed at early detection and prevention of the development of a disease, its acute condition, complications and chronicity, limitation of life activity, causing maladjustment of patients in society, reduced working capacity, including disability and premature

Tertiary



is a complex of medical, psychological, pedagogical and social measures aimed at eliminating or compensating life limitations and lost functions to restore social and professional status as much as possible. Its synonyms is health rehabilitation or restoration.

Primary prevention includes various forms of work, e.g.:

1. Formation of a healthy lifestyle, including:
 - Creation of a permanent information and propaganda system aimed at increasing the level of knowledge of all population classes about the impact of negative factors on health (Health Days, mass media);
 - Sanitary and hygienic education (consultations, “schools of health”);
 - Reduction of smoking, alcohol, other addictions;
 - Involving population in physical activities, increasing the availability of various types of health improvement

The school of Health



Main Tasks of School

1. increasing patient awareness of the disease, risk factors for its development and complications;
2. teaching patients how to reduce everyday risk factors (bad habits, diet, physical activity, stress control) that influence on health;
3. training patients in methods of self-control and self-help, first aid in case of acute conditions;
4. increasing patients' motivation for their recovery, adherence to treatment and following doctor's recommendations.

Primary prevention (continue)

2. Measures to prevent the development of somatic and mental diseases, injuries, including professionally caused ones, accidents, disabilities from unnatural causes, road traffic injuries (rational nutrition and physical activity, seat belts);
3. Immunoprophylaxis from various infectious diseases among various population groups

For example,

The effectiveness of non-drug correction in Cardiovascular disease

The DASH study (Dietary Approaches to Hypertension Control) demonstrated the reduction in diastolic blood pressure (6 mmHg) comparable to drug therapy with salt and fat decrease, and increased fruit intake. Decreased DBP by 5 mmHg in population leads to a decrease in the frequency of cerebral strokes by 34%, and coronary artery disease by 21%

D. Kromhout, A. Menotti, H. Kesteloot, S. Sans. Prevention of Coronary Heart Disease by Diet and Lifestyle Evidence From Prospective Cross-Cultural, Cohort, and Intervention Studies/*Circulation*. 2002;105:893

Current Perspective

Prevention of Coronary Heart Disease by Diet and Lifestyle Evidence From Prospective Cross-Cultural, Cohort, and Intervention Studies

Daan Kromhout, PhD, MPH; Alessandro Menotti, MD, PhD;
Hugo Kesteloot, MD, PhD; Susana Sans, MD, PhD

Research on the cause of coronary heart disease has been ongoing for approximately a century.¹ From the beginning, diet played a prominent role in research on the origin of coronary heart disease. The original diet-heart hypothesis was very simple. Cholesterol is a constituent of the atherosclerotic plaque. Therefore, it was thought that there was a direct relation between cholesterol in the diet (ie, eggs), cholesterol in the blood, cholesterol in the plaque, and its clinical complications, such as myocardial infarction.

In the second part of the past century, it became clear that dietary cholesterol played a minor role in regulating serum cholesterol levels. It was also shown that dietary fatty acids are the major determinants of serum cholesterol.² The study of lipoprotein metabolism showed that the cholesterol-rich LDL fraction, not total cholesterol, was most strongly related to the development of atherosclerosis and its sequelae.³ Experimental research was essential to understand the mechanisms by which genes, hormones, and diet interact to regulate the serum cholesterol level.⁴ LDL cholesterol levels can be increased by saturated fatty acids, especially those with 12 to 16 carbon atoms, and by *trans* fatty acids.⁵

Several hypotheses have been proposed to explain the initiating events in atherogenesis, eg, the response-to-injury, response-to-retention, and oxidation hypotheses.⁶⁻⁸ These hypotheses are not mutually exclusive and may even be compatible with each other. The oxidation hypothesis emphasizes the importance of oxidative modification in the atherosclerotic process, because compared with native LDL, oxidized LDL is preferentially taken up in the arterial wall.⁹ This hypothesis makes a role of diet and lifestyle in atherogenesis likely, because LDL can be oxidized by smoking, for example, and oxidation can be prevented by dietary antioxidants, eg, vitamins and polyphenols.

There is overwhelming evidence that smoking, alcohol, and physical activity are important determinants of coronary heart disease. Prospective cohort studies showed a strong, graded relationship between cigarette smoking and coronary heart disease.⁹ A moderate alcohol intake of 1 or 2 drinks per

day is associated with a 30% to 40% lower risk of coronary heart disease.¹⁰ Prospective cohort studies have also shown that the relative risk of coronary heart disease for inactive subjects compared with active persons is ~2 times higher.¹¹

Complex interactions between diet, lifestyle, and lipoprotein metabolism determine the development of atherosclerosis and its complications. This article reviews the evidence from major prospective cross-cultural, cohort, and intervention studies and focuses on the effects of a healthy diet and lifestyle on heart health. Recently, the results of large prospective cohort studies became available that show that a healthy diet and lifestyle, along with low levels of serum cholesterol and blood pressure and not smoking, are associated with a low risk of coronary heart disease.¹²⁻¹⁵ The implications of these studies for primary and secondary prevention of coronary heart disease will be discussed.

Evidence From Cross-Cultural Studies

The interest in explaining differences in the occurrence of coronary heart disease between populations goes back almost a century. In 1916, the Dutch physician De Langen published an article titled "Cholesterol Metabolism and Racial Pathology."¹⁶ He noted that the cholesterol levels of Dutch immigrants in the former Dutch Indies were approximately twice as high as those of native Javanese. He hypothesized that these differences were due to differences in diet and that hypercholesterolemia was associated with metabolic diseases such as atherosclerosis, diabetes, obesity, and nephritis. However, it took approximately half a century before the associations between diet, cholesterol, and coronary heart disease were studied in a systematic way.

In the 1950s, Keys and coworkers performed pilot studies in the United States, Japan, and northern and southern Europe which showed that cholesterol levels were high in the United States and Finland and low in Japan and southern Europe.¹⁷ By visiting hospitals in these countries, they also noted large differences in the prevalence of coronary heart disease patients and observed substantial differences in dietary pat-

From the Division of Public Health Research (D.K.), National Institute of Public Health and the Environment, Bilthoven, the Netherlands; Association for Cardiac Research (A.M.), Rome, Italy; University of Leuven (H.K.), Department of Epidemiology, Faculty of Medicine, Leuven, Belgium; and Programa Cronica (S.S.), Institute of Health Studies, Hospital de San Pau, Barcelona, Spain.

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(*Circulation*. 2002;105:893-898.)

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Circulation is available at <http://www.circulationaha.org>

DOI: 10.1161/0002-0372.2002.103728

Primary prevention (continue)

5. Taking measures **to reduce the impact of harmful factors on the human body** (improving the quality of the air, drinking water, structure and quality of nutrition, working, living and resting conditions, level of psychosocial stress and other ones affecting the life quality), carrying out environmental and sanitary hygiene screening.

6. **Rehabilitation of individuals and groups of population** who are under the influence of factors unfavorable to health using medical and non-medical measures (e.g., iodized salt; purchase of equipment for screening environmentally dependent diseases)

For example,

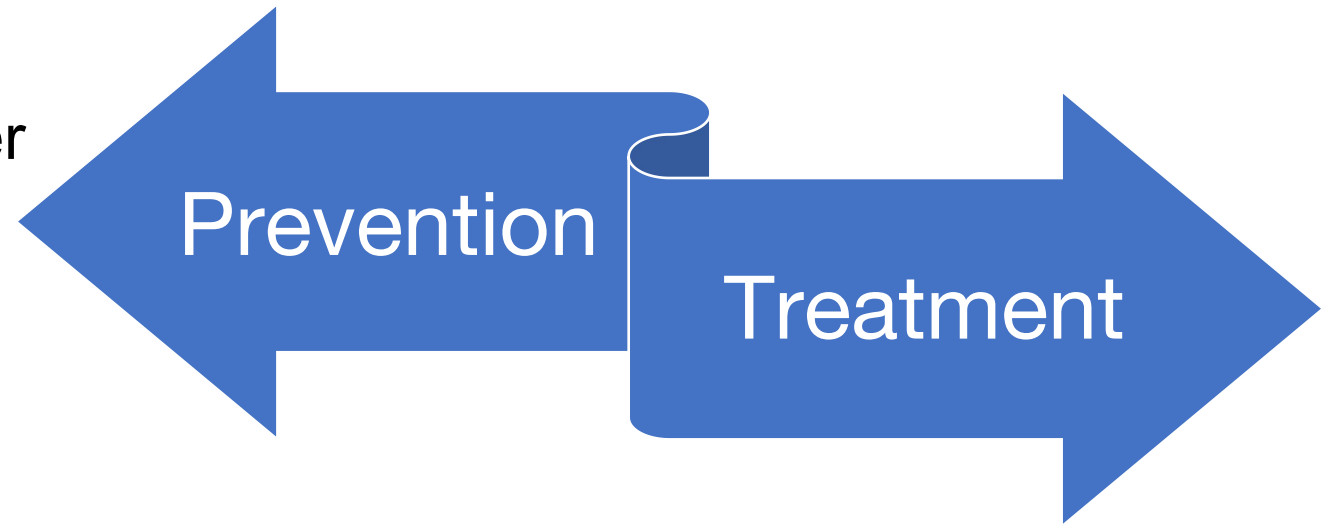
RCT in the framework of the project "The Women's Health Initiative" are stopped till its full completion.

In 8506 women who received HRT, had significantly more coronary stroke episodes, thromboembolism, invasive forms of breast cancer

D. L. Sackett. The Arrogance of preventive medicine. CMAJ, 2002.167(4)



1. Reducing preventable death number
2. Decreasing morbidity
3. Improving life quality
4. Functional independence



5. Changing modifiable risk factors: smoking, unhealthy diet, physical inactivity
6. Improving knowledge about health, motivation, behavior, personal skills
7. Reducing mortality level
8. Absence of treatment complications
9. Improving life quality
10. Functional independence

Study of food and smoking carried out in Oslo

12866 men were randomized into two groups

Intervention group - multifactorial intervention during 7 years

Control group received usual medical care

In 16 years, CVD mortality in intervention group was 11.4% lower

Mortality from all causes had the same trends

Circulation.1996;94:946-951



2008 Nobel Prize winners in medicine for discovering human papillomavirus causing cervical cancer



Harald zur Hausen (Germany)

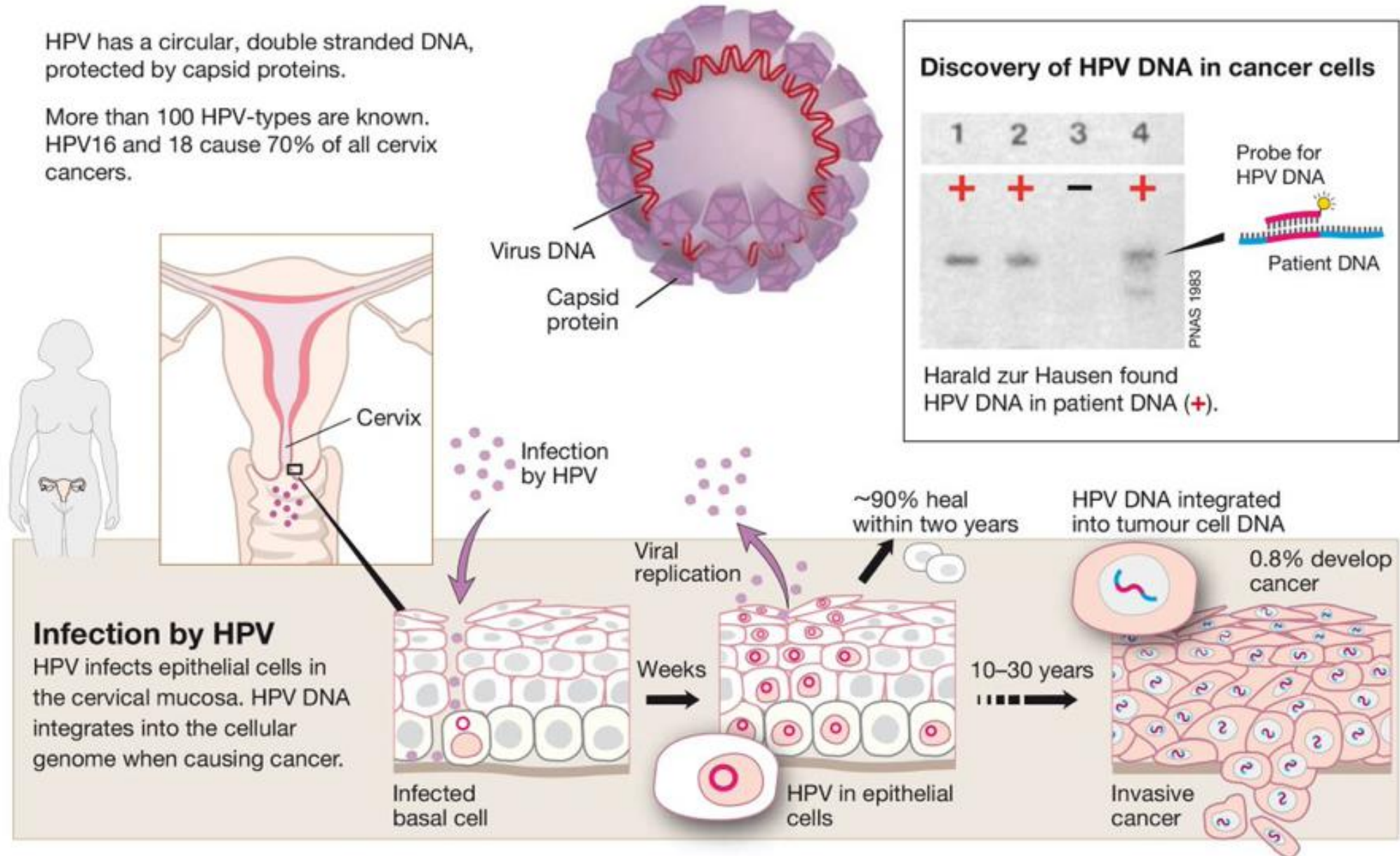


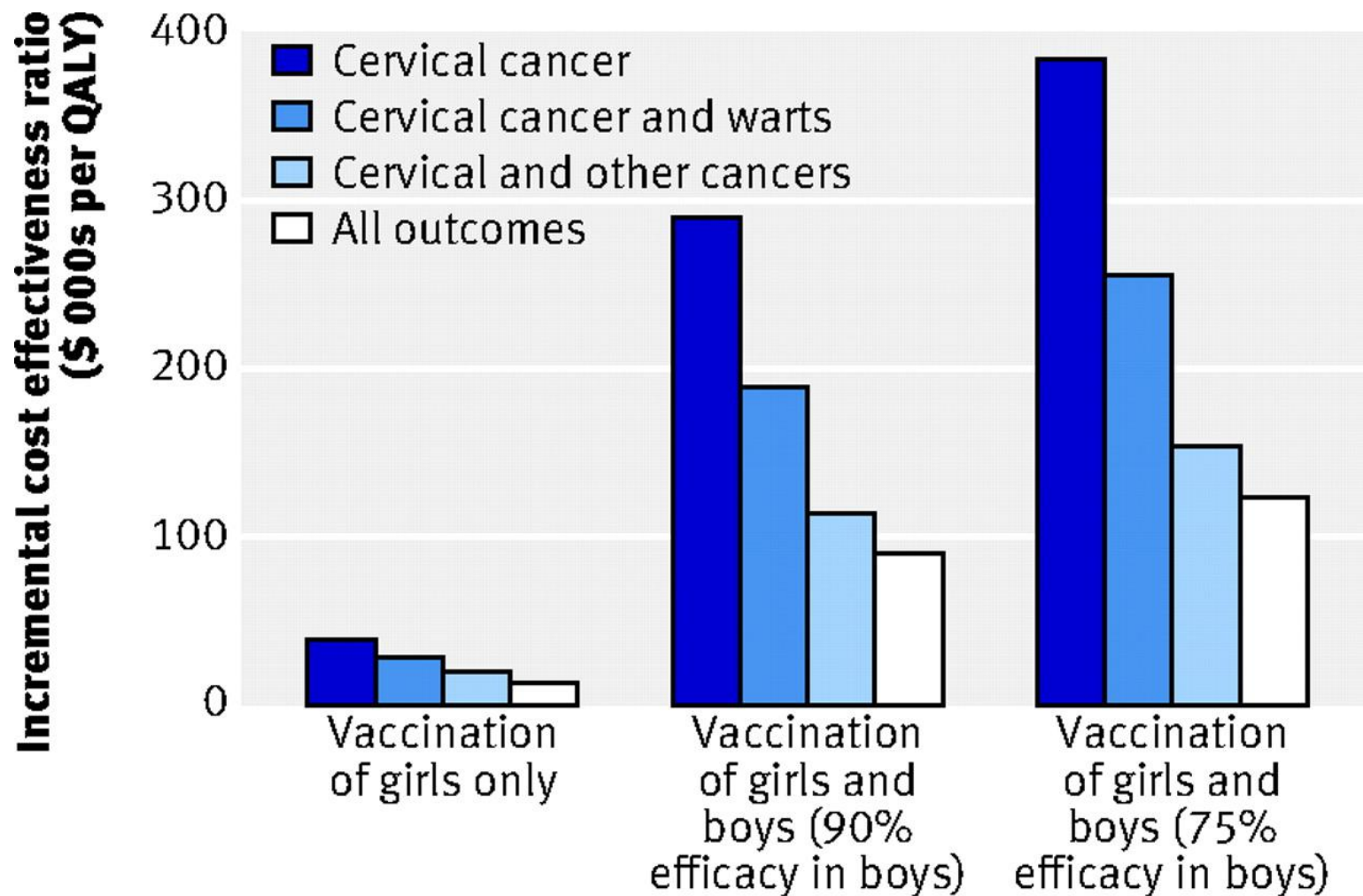
Françoise Barre-Sinoussi (France)

HPV – human papilloma virus

HPV has a circular, double stranded DNA, protected by capsid proteins.

More than 100 HPV-types are known. HPV16 and 18 cause 70% of all cervix cancers.





Recommendations

To prevent caused by HPV 16,18,6,11:

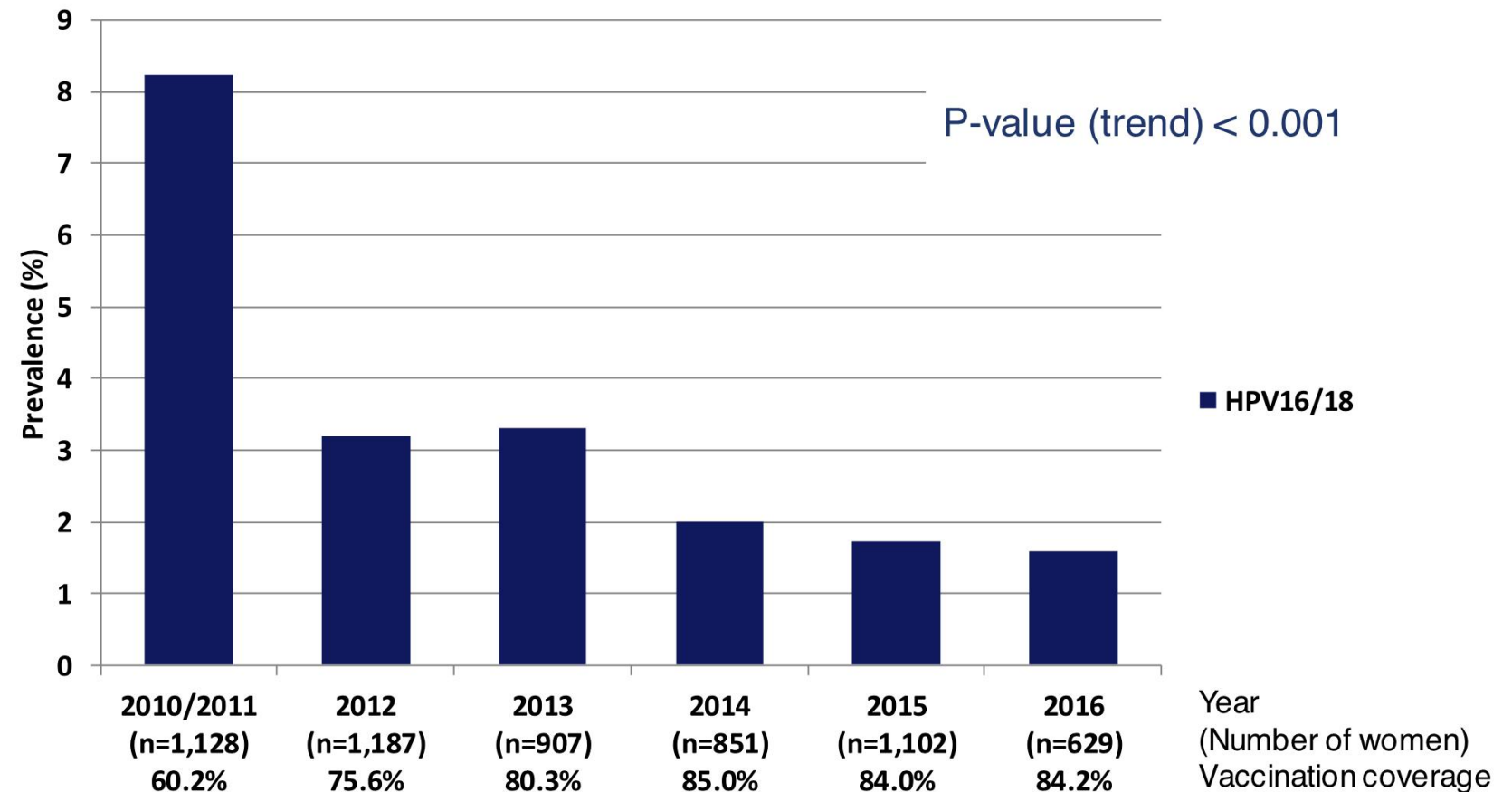
- Cancer of cervix, vulva, vagina
- Genital condyloma
- Cervix dysplasia

Contraindications

1. Hypersensitivity to active components and agents of the vaccine.
2. Blood clotting disorders due to hemophilia, thrombocytopenia or due to taking anticoagulants.
3. Pregnancy.

Start vaccinating from the age of 9* today for
“TOMORROW”
future

Changes in post-vaccination HPV prevalence in England: 16-18 year old females



Gardasil is included in the vaccination schedules of 29 countries

Vaccination of girls:

- Great Britain
- Germany
- Italy
- France
- Spain
- Norway
- Sweden
- Switzerland
- Belgium
- Denmark
- Luxembourg
- Liechtenstein
- Argentina
- Bermuda
- USA
- Canada
- Greece
- Australia
- Israel
- Hong Kong
- Czech
- Slovakia
- Poland



Attitude of primary care physicians to prevention

Russian doctors

- Recommendation quality
- Low efficiency
- Lack of patient's interest
- Prevention is not the doctor's responsibility
- Time limit
- Lack of knowledge within the framework of high school curriculum

Danish doctors

- Ethical doubts
- Uncertainty about the effect
- Lack of patient's interest
- Uncertainty about the effectiveness of intervention
- Time limit
- Lack of training in counseling

Secondary Prevention

Forms of secondary prevention

1. Targeted sanitary and hygienic education, including individual and group counseling, giving patients and their families knowledge related to a particular disease, training certain skills;
2. Carrying out dispensary examinations in order to assess the dynamics of health state, implementation of recreational and therapeutic measures;



3. Carrying out courses of preventive treatment and targeted rehabilitation, including: therapeutic nutrition, physiotherapy exercises, medical massage, sanatorium treatment;

4. Conducting medical and psychological adaptation to changes in health status, formation of proper perception and attitude to the changed capabilities and needs of the body (psycho-trainings)

5. Conducting medical, social, state activities aimed at reducing the influence of modifying risk factors, maintaining residual working capacity and the ability to adapt in social environment, creating conditions for optimal life of patients and disabled people (architectural and planning solutions, additional medication provision, provision medical and other equipment)



Tertiary Prevention

Medical Prevention

Regarding the population it can be divided into the following ones:

- Individual - conducted for single individuals (individual preventive consulting);
- Group - conducted for a group of people with similar symptoms or risk factors (group consulting, preventive examinations);
- Population - conducted for the entire population (preventive actions, campaigns, exhibitions, competitions, mass media publications)

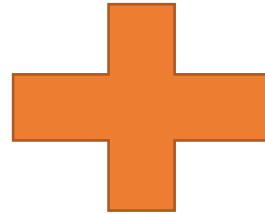
Medical Prevention

- Specific - acting on the pathogen (vaccination);
- Non-specific - affecting the whole body (combating smoking, poor nutrition, physical inactivity)

Risk factor



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Social Marketing or
how to promote the ideas of
preserving and improving the
population health

Social marketing in healthcare

Includes combination of various activities related to health education, social advertising, economics and management of scientific research, system analysis, psychology and epidemiology, and the organization of preventive work with the population.

Social marketing is not a self-discipline, but rather many disciplines used for a common aim.

Means efforts for persuading people and making them do specific actions or getting into the habits that are generally recognized as useful; at the same time a person always has the right to choose (has an alternative)

*social marketing is used both in primary, secondary and tertiary prevention, as well as in individual, group and mass preventive work.

Thus, social marketing means efforts,
aimed at persuading people and making them do specific
actions or getting into habits that are generally recognized
to be useful.

(implementation of social marketing programs on the example of
prevention of smoking)

How often were recommendations for lifestyle modification made by healthcare professionals?

1. Recommendations to stop smoking - 8.7%
2. Recommendations for healthy nutrition - 9.1%
3. Tips to increase physical activity - 5.1%

Data from a telephone survey of residents of St. Petersburg, 2002

Debate & Analysis

Making health habitual:

the psychology of 'habit-formation' and general practice

MAKING HEALTH HABITUAL

The Secretary of State recently proposed that the NHS:

*'... take every opportunity to prevent poor health and promote healthy living by making the most of healthcare professionals' contact with individual patients.'*¹

Patients trust health professionals as

cues that have been associated with their performance:^{5,6} for example, automatically washing hands (action) after using the toilet (contextual cue), or putting on a seatbelt (action) after getting into the car (contextual cue). Decades of psychological research consistently show that mere repetition of a simple action in a consistent context leads, through associative learning, to the action being activated upon subsequent

10 simple diet and activity behaviours and encouraging context-dependent repetition, or a no-treatment waiting list control. After 8 weeks, the intervention group had lost 2 kg compared with 0.4 kg in the control group. At 32 weeks, completers in the intervention group had lost an average of 3.8 kg.¹⁴ Qualitative interview data indicated that automaticity had developed: behaviours became 'second nature', 'worming their

ORIGINAL SCIENTIFIC PAPER

QUALITATIVE RESEARCH

Patients' perceptions of their general practitioner's health and weight influences their perceptions of nutrition and exercise advice received

Sally E Fraser BHSoc, MNutDiet;¹ Michael D Leveritt BSc (Hons), MNutDiet, PhD;² Lauren E Ball BAppSc (Ex & SpSc), MNutDiet, PhD³

ABSTRACT

INTRODUCTION: General practitioners (GPs) play an important role in the management of patients who are overweight or obese. Previous research suggests that GPs' physical characteristics may influence patients' perceptions of health care received during consultations, mediating the likelihood of patients following health advice provided by GPs. This study aimed to explore patients' perceptions of their GP's health status and its influence on patients' perceptions of healthy eating and exercise advice.

METHODS: An interpretive approach to phenomenology underpinned the qualitative inquiry and study design. Twenty-one participants (aged 55.9 ± 6.5 years; 14 females, 7 males) who had previously received healthy eating and/or exercise advice from a GP participated in an individual semi-structured interview. A constant comparison approach to thematic analysis was conducted.

FINDINGS: Participants identified three key indicators of perceived health of their GP. These included the GP's physical appearance, particularly weight status; perceived absence of ill health; and disclosure of a GP's health behaviours. Participants expressed favourable perceptions of the weight status of their GP. Participants expected their GP to be a healthy role model and often, but not always, felt more confident receiving advice from a GP that they perceived as healthy.

CONCLUSION: The findings highlight that a GP's perceived health status influences patients' perceptions of the health advice received during consultations. These findings provide a foundation for future research that may allow GPs to modify patients' perceptions of their health status in order to facilitate behaviour change in overweight or obese patients.

KEYWORDS: Body weight; general practitioners; obesity; overweight; physicians; primary health care

Introduction

More than 60% of the Australian population are classified as overweight or obese.¹ Overweight and obesity pose a major risk to long-term health by increasing the risk of many lifestyle-related chronic conditions, including cardiovascular disease, Type 2 diabetes, osteoarthritis and some cancers.² The economic impact of obesity in Australia is multifaceted, including direct financial costs to the Australian health care system, family and carer costs, as well as reductions in

productivity.³ The total financial cost of obesity in Australia has been estimated to be \$3.7 billion per annum.³

Health professionals are encouraged to promote healthy eating and physical activity to patients in order to reduce the incidence of overweight and obesity in Australia.⁴ In particular, general practitioners (GPs) are well placed to promote healthy eating and physical activity to patients, with more than 86% of the population consulting

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³Griffith Health Institute, Griffith University, Gold Coast, Australia

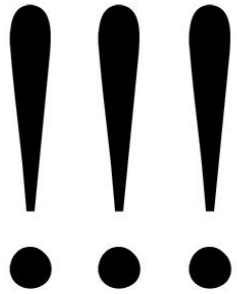
J PRIM HEALTH CARE 2013;5(4):301-307

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Conditions for the implementation of social marketing

- People should know that by giving preference to this or that way of behavior, they have choice (alcohol or physical activity).
- They should understand what their behavior can lead to (long-term effects in their offspring)
- People should be able to take the necessary measures and choose the way of behavior (helpers, external conditions);
- They should be aware that taking the recommended action or way of behavior will give them more use than another course of action (promotion).

Stages of Effective Social Marketing



Stage 1 – Problem determination

Stage 2 - Selection of appropriate target audiences

Stage 3 - Development of a marketing plan

Stage 4 - Making a decision



Stage 1 – Problem determination

To determine the nature of the problem, the following information is required:

1. information about the incidence of diseases and deaths,
2. information about disabilities,
3. information about the economic consequences associated with them (use city, district health data)

Stage 2 - Selection of appropriate target audiences

Problem setting influence the choice of target audiences. It is necessary to divide the potential audience into relatively homogeneous subgroups and select one or more groups as the basis for developing a social marketing program.

Stage 3 - Development of a marketing plan

A social marketing plan should include four obligatory components:

1. Forming of a new model of behavior;
2. the “cost” of this change;
3. place where and in what way a person can receive a product or information;
4. propaganda.

Education should be conducted in a language known by the majority of patients with different levels of education and cognitive abilities.

PRODUCT

Social marketing programs are based not only on the promotion of abstract ideas, but offer people some specific (tangible) product that can be used to make person change the behavior and do it as easy and effective as possible. E.g., breast cancer prevention is mammography; prevention of hypertension - measurement of blood pressure

PRICE

In general, the cost of a product is determined by the cost of acquiring it.

PLACE

The concept of 'location' implies impact on people's perceptions and attitudes to what they are offered. E.g., a program promoting the use of contraceptives, or opening of temporary blood pressure checkpoints within a hypertension prevention program.

PROMOTION

The informational or promotional component of a social marketing program may include advertising, public relations, providing publicity, personal contact and other ways of popularization.

Information in mass media:

- must be clear and timely;
- transmission of information must be targeted.

Stage 4 - Making a decision

This stage of social marketing process includes four separate sub-stages:

- Detecting people ready to act;
- Setting their tasks;
- Identifying communication channels with these people;
- Developing information materials.

Conclusion

- The use of social marketing in promoting the ideas of maintaining health and disease prevention will only be effective if the mentioned stages of action are strictly followed, since they are formed being based on interests of people, their ideas about values and benefits.
- Attempts to implement social marketing without taking into account the demands of the population and its needs, are likely to be unsuccessful or will give less durable results.

Recommended reading

Main ones

- | | | |
|---|---------------|--------|
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Электронные ресурсы

- | | |
|---|---|
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| 2. Здоровая Россия | Интернет-ресурс http://www.takzdorovo.ru/ |
| 3. Калькулятор калорий | Интернет-ресурс http://www.calorizator.ru/ |



Thank you for attention