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Health Literacy – An economic perspective and data for Switzerland

Part 2: A Review of Health Literacy Measures and A Cost Assessment of Limited Health Literacy

Simon Wieser[1], Karine Moschetti[2], Klaus Eichler[1], Alberto Holly[2], Urs Brügger[1]

[1] Winterthur Institute of Health Economics, Zurich University of Applied Sciences

[2] Institute of Health Economics and Management, University of Lausanne

Correspondence:
Simon Wieser
Winterthur Institute of Health Economics (WIG)
ZHAW Zurich University of Applied Sciences
St. Georgenstrasse 70 / Postfach 958
8401 Winterthur
058 934 68 74 / wiso@zhaw.ch

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Summary

1 Measuring health literacy in Switzerland: A review of six surveys

This review summarizes and compares the information on health literacy (HL) in Switzerland provided by the six following national and international surveys:

1. Gfs-UNIVOX survey (UNIVOX survey),
2. Survey by Institute of Comunication and Health, Università della Svizzera Italiana Lugano (USI survey),
3. Institut für Sozial- und Präventivmedizin survey (ISPMZ survey),
4. Swiss health survey (SHS),
5. Survey of Ageing and Retirement in Europe (SHARE) and
6. Adult literacy and life skills survey (ALL).

Section 1.1 provides a comparison of the surveys describing their main characteristics and the items related or pertinent to HL. Some of the results on HL that were revealed by the surveys are summarized in section 1.2. Section 1.3 discusses some limitations of the surveys and the potential analysis that might be conducted with their information in order to identify the economic impact of Limited HL in Switzerland.

1.1 Comparison of questionnaires

Table 1 (page 5) summarizes general information included in the different surveys.

While all individuals aged over 18 years constitute the target population for most surveys, SHARE is limited to people aged over 50 and ALL to individuals below 65. Moreover, the UNIVOX sample is limited to Swiss citizens. The sample size varies from a minimum of 1005 for SHARE to a maximum of 20'000 for the SHS. The international dimension and the variety of subjects covered by SHARE explain the relatively small size of the sample. The three linguistic regions of Switzerland are represented in all of the samples except for the UNIVOX survey, where the Italian speaking part of the country was not interviewed.

All surveys include data on socio-demographic and economic variables and on education and health status (see table 2 page 6). Self reported health is available in all surveys and the Body Mass index can be calculated in the USI, ISPMZ, SHS and SHARE surveys. Data on health service use and on individual prevention or health promotion are only available in SHS and SHARE.

We examined the six questionnaires (when available) in order to assess the way HL is measured and identify items related to HL (see table 2 page 7). With the exception of the ISPMZ survey they do not have the measurement of HL in Switzerland as their primary goal. In the UNIVOX questionnaire the questions on HL represent a section of the broad questionnaire. The USI survey principally aims to assess perceptions regarding bodyweight and nutrition but also includes some questions related to these topics that help to capture HL in Switzerland while the SHS also includes some items measuring some kind of HL. The SHARE and ALL surveys do not address HL directly but collect information on general literacy, which is related to HL.

Following Nutbeam (1999) we tried to classify the HL measurements we found in the surveys into 3 levels: functional HL, interactive HL and critical HL where the levels reflect increasing degrees of autonomy and personal empowerment. Since the distinction between these levels of HL is not always clear cut it is sometimes difficult to

classify the level of a certain HL measurement. Moreover, within each group, questions asked are specific to the type of surveys carried out.

The functional level of HL encompasses all aspects of transmission of information on health ranging from health risks to the use of health service. In the UNIVOX and the ISPMZ surveys, functional HL was measured by general knowledge regarding health. For instance, we identified items related to familiarity on diseases, nutrition habits or/and the implications caused by these diseases. Functional HL also refers to the understanding of media information, information given by general practitioners (GPs) or information from medicine pamphlets. The two previous surveys focussed on these aspects as well. Finally, the SHS asked about the importance given to health in general.

The interactive level of HL refers to the opportunities to develop skills in a supportive environment. Interactive HL is improved by the ability of people to interact with others about health problems or about general health domains. This type of HL is assessed in the UNIVOX, ISPMZ and USI surveys through questions related to self-rated ability to communicate with others (friends, GPs) on own health problems or health topic.

The critical level of HL refers to personal and community empowerment regarding health or health decisions. For instance, the UNIVOX survey asked people about their ability to organise their daily life in a healthy way. The USI survey included several open questions regarding the prevalence of problems related to body weight, nutrition, physical exercise and healthy bodyweight. For instance, the following questions were asked: “What are the factors responsible for overweight? How important is the problem? What should the government do?” These questions give an idea on the individual perception of problems related to bodyweight. The ISPMZ survey was interested in evaluating whether people had capacities to play an active role regarding their health within the Swiss health system. Finally, the SHS asked about the difficulties that may prevent people from having a healthy nutrition. Another dimension of HL captured in the SHS dealt with individual opinions about the role played by institutions regarding health.

Based on the same three levels classification (functional literacy, interactive literacy and critical literacy), we reported items on general literacy available in the two other surveys (SHARE, ALL survey). Whereas in SHARE, the main focus is health, this domain is not investigated at all in the ALL survey. SHARE and the ALL survey do not include data on HL but include information on general literacy. Indeed, data on functional literacy such as self rated reading and writing skills and numeracy are available in both the surveys. Information on interactive literacy is captured by the verbal fluency in SHARE and by the use of information and communication technology in the ALL survey. People’s ability to think about things and problem-solving practices classified in critical literacy are evaluated in both of the surveys.

Table 1. Comparison of HL surveys: general information

Survey name	Type of survey	Goal of the survey	Year	Target population (age)	CH sample	Selection procedure	Type of interview	External validity / representativeness (for CH population)
gfs Univox	National	Broad opinion survey. Health is one of several domains. HL is health focus in 2006.	2006	Swiss citizens >=18	705 (75% German, 25% French)	data collectors have to interview a certain number of individuals with predetermined demographic characteristics.	face to face interview 45 minutes on the street	no foreigners
USI	National	Opinions, perceptions and SA regarding nutrition, exercise & healthy body weight. Special interest in media perception.	2006	Residents >=16	1'441 regionally stratified	7'000 numbers provided by BFS. Numbers were called until required number of interviews was reached - each number was dialled up to 5 times	landline telephone interview of 30 minutes - 58 questions	13.2% foreigners
ISPMZ	National	Assess HL in CH.	2007	Residents >=16	1'250 (52% German, 24% French, 24% Italian)	in collaboration with professional survey institute based on telephone numbers, stratification by age, gender and language region	landline telephone interview of 30 minutes - 150 questions	11.4% foreigners; 18% over age of 65; highest education: 4% primary school, 13% compulsory school
SHS	National	Assess health in CH.	every 5 years started in 1992	residents >=15	5'120 in Switzerland (37% German, 34% French, 29% Italian)		landline telephone interview + self completed questionnaire	aims at being representative of the Swiss population. However, the % of foreigners and low-income people have to be calculated.
SHARE	International	Assess health, retirement and living conditions of European elderly	2004 and 2006	residents >=50, included spouses age<50	1'004 (<50: 4%, 50-64: 50%, 65-74: 25%, >=75: 20%) (75% German, 19% French, 6% Italian)	5120 (37% German, 34% French, 29% Italian)	face to face interview 60 minutes at home	representative of population aged over 50
ALL	International	Assess literacy of population	2003	residents 16<=age<=65	5'120 (canton Zurich 12%, other German speaking cantons 28%, canton Geneva 11%, other French speaking cantons 26%, Ticino 22%)	18'000 randomly selected households with landline telephone contacted, 13'000 satisfy selection criteria, random selection of one individual in each household, 40% agree to participate	interview of approx. 120 minutes in home of respondent	no inclusion of people over 65 years old

Table 2. Comparison of HL surveys: non HL items

Survey name	Sociodemographic (always gender and age)	Economic	Education	Health status	Health care use	Individual prevention	Other
gfs Univox	language area, rural	household income	highest education	self reported health	none	none	vote / non vote, sympathy for which political party
USI	language area, rural, region, nationality		highest education	size and weight (=>BMI)	none	none	language of interview
ISPMZ	n. of individuals in household	household income	education - measured by the highest degree obtained	Self reported health and chronic disease, weight (=> BMI)	use of health care facilities - measured by night stayed in hospital, GP visits and drug consumption.	none	
SHS	household composition, citizenship, marital status, language	income, profession, current work activity, security in employment	education measured as the highest school degree obtained	accidents, handicap, temporary disability, illnesses, oral health, psychological health, self-reported health, health of children age<15 (breeding, accidents and handicaps)	health insurance hospitalization, general practitioner (GP) visits, specialist visits, home care in own home	physical activity, eating habits, tobacco and alcohol consumption, drugs utilization	social network
SHARE	household composition, citizenship, marital status, language	current work activity, job characteristics, opportunities to work past retirement age, sources and composition of current income, wealth and consumption, housing	education - measured by 1) International ISCED code or 2) as the highest school degree obtained	self-reported health, physical functioning, cognitive functioning, health behaviour, psychological health, well-being, life satisfaction	use of health care facilities - measured by night stayed in hospital, GP visits, specialist visits and drug consumption.	physical activity, tobacco and alcohol consumption	social support (assistance within families, transfers of income and assets, social networks, volunteer activities)
ALL	size of family, language, immigrant status, ethnicity, parental education and occupation	income, occupation, industry, work status and history	education (extensive section), adult education and learning (extensive section), training	self-reported health (subjective and objective health with respect to limitations)		none	number of books at home, reading practices with children

Table 3. Comparison of HL surveys: HL items

Survey name	Functional HL	Interactive HL	Critical HL
gfs Univox	Knowledge on illnesses, number of wine per day that is not a threat to health. Self-rated understanding of information media or patient information leaflet and oral instruction in pharmacy. Test on understanding a medicine patient leaflet.	Self-rated ability to communicate on own health problems.	Self-assessment of critical thinking on the information media.
USI	Knowledge on frequent diseases caused by overweight, knowledge on nutrition. Self-rated ability of what a healthy nutrition or healthy physical activity is. Self rated ability to judge if own body weight is healthy.	Frequency in communicating with others about weight problems.	Satisfied with body weight?
ISPMZ	Self assessment of knowledge in different areas. Understanding of information given by GPs. Self assessment of the complexity of choosing a medication /a GP/ a health insurance/ a healthy diet.	Options of treatment given by GPs. Possibility to have an active role. Media used regarding health choices. Understanding of media information.	Reactions of patients on their willingness to play an active role in decisions regarding their health.
SHS	Importance given to health in general.		Opinions on the role played by institutions regarding health. Satisfaction regarding body weight, Willingness to loose weight (15<age<25). Difficulties regarding healthy nutrition.
SHARE	Self-rated reading skills. Self rated writing skills. Numeracy	Verbal fluency	Memory and ability to think about things
ALL	Self-rated reading skills. Self rated writing skills. Workplace literacy. Numeracy.	Information and communication technology use and familiarity	Problem-solving practices in general and at home. Civic engagement

1.2 Measures of HL in Switzerland

This section presents some of the findings of the six surveys on the level of HL in Switzerland. These findings are thus not the result of our own analysis but have been previously published by the researchers. After presenting regional differences on HL in Switzerland, we display the results according to the three levels of HL previously described: functional HL, interactive and critical HL. Note that most of the results are associated with the first level of HL.

Regional differences on HL

Using data of the Health Literacy Survey, the ISPMZ shows regional differences in HL in Switzerland. In particular, there are deficiencies in the Italian speaking part regarding the understanding of printed material and communication with doctors whereas the German speaking part of Switzerland shows a high interest in activities related to own health. The French speaking part has lowest interest in new media dealing with health information and self-care. Regional differences in HL seem to be associated with cultural and structural factors. Moreover, the ISPMZ team found a positive correlation between HL and education.

Functional HL

Can AIDS be cured? is for instance a typical questions asked in order to evaluate the functional HL of the respondents. In 2006 the question was answered correctly by 84% of the interviewed (UNIVOX). Compared to 1999 on average knowledge of respondents increased, but, many elderly and individuals with low education did not answered correctly.

Responses to questions on nutrition and alcoholic beverages reveal a good HL of the interviewed (UNIVOX). The figures also show that HL slightly improved since 1999. Most respondents had a correct knowledge of the nutritional pyramid and 86% of the respondents knew that 2 glasses of red wine per day do not pose a threat to health. Moreover, this percentage was equal to 74% in the previous survey of 1999. The improvement in HL might result from the prevention campaigns carried out by the health authorities.

The assessment of opinions and perceptions on nutrition and body weight shows that the respondents are aware of diseases caused by overweight such cardiovascular diseases, diabetes and artrophathies (USI). However, only 2% of the respondents reported cancer risk as a potential disease associated with overweight. Respondents seem to be aware of what healthy nutrition is and overweight and obese individuals are even more aware than normal and underweight individuals that fats and sugar should be avoided.

On the other hand, respondents believe that 50% of the Swiss population has unhealthy eating habits, but only 25% believe they personally do. Moreover about 2/3 of the overweight and obese people believe that their overall eating habits are healthy (USI). Another study reports that 86% of the interviewed people declare to have a regular physical activity and a healthy diet (ISPMZ).

Respondents are confident in their ability to judge whether their weight is healthy or unhealthy and this observation does not seem to be affected by the education level. While respondents on average believe that 33% of the population is overweight, only 14% see themselves as overweight. In particular, two third of individuals classified as overweight people (Body mass index between 25 and 30) do not believe that their

weight is unhealthy, while most of those classified as obese believe their weight is unhealthy. In general, women feel more confident on nutrition, men on exercise (USI).

While respondents believe that 50% of the Swiss population does not have enough physical activity nearly 66% believe that they personally do. Perception of not making enough physical efforts increases with weight. Half of the overweight individuals and 25% of the obese individuals declare to be satisfied with their weight (USI).

Identifying whether people feel comfortable with information included in newspaper articles, in patient leaflet, in certain booklets, or with information given by TV & radio or by some promotional material also helps in assessing HL. The ISPMZ survey reveals that the most important sources of information regarding health choices are print media (46%), general practitioners (33%), internet (31%), friends (31%), and radio or TV (29%). For 25% of the interviewed individuals, it is difficult to understand information in media. The UNIVOX survey shows similar results with only 50% of the interviewed declaring to have a good comprehension of all these sources of information.

While 87% of the respondents report to understand correctly the information given by pharmacists, a test based on the understanding of an Aspirin patient information leaflet shows that only 1/3 of the respondents did correctly answer to a simple question regarding the dosage schedule of the medicine. Thus compared with the self-rated HL of individuals, this test reveals that respondents overestimate their HL.

Interactive HL

The survey dealing with body weight reveals that overweight and obese people communicate quite often with others as they report to talk at least once a week about weight problems with others. The UNIVOX survey indicates that the ability to communicate with others when health problems exist is problematical especially among elderly and low educated people.

Critical HL

The third dimension of the HL is related to the critical capacity of people in understanding and using the available health information in order to take decisions about their health. The ISPMZ survey deals with the health decisions taken by individuals and shows that almost 2/3 of respondents declare that it is complex to choose an adequate medication.

The UNIVOX survey shows that 61% of the interviewed in general no difficulties have in deciding which information in the media they can use or not. However, 10% estimate their ability as limited. Difficulties are especially observed among the elderly and individuals with low education. The survey shows similar results when assessing whether respondents are able to organise their daily life in a healthy way.

Regarding the health choices the ISPMZ survey suggests that respondents would like to make choices about their health but that decisions are complicated and information is scarce. In particular, respondents with chronic illness have interest in disease management, but most of them lack of adequate knowledge. Among those who took care of friends or relatives in the last past 12 months only few disposed of adequate knowledge (ISPMZ). These results suggest that respondents would like to play an active role in decisions regarding their health, but lack of literacy to do so.

1.3 Discussion of Swiss data on HL

We now discuss some of the limitations of the six surveys presented. This section also examines potential analysis that might be conducted with the available information in order to identify the economic impact of limited HL in Switzerland.

The main weaknesses of the surveys are the following:

1. According to research carried out in the USA, the individuals with low income, the elderly and the migrants are particularly affected by limited HL (Kirsch et al. 1993). It is highly plausible that this is also the case in Switzerland. Unfortunately these individuals are probably underrepresented among the respondents of the surveys because they are harder to reach and less likely to participate for a number of reasons:

- Some surveys simply exclude these individuals. UNIVOX is limited to Swiss citizens and ALL excludes individuals over the age of 65.
- Individuals with limited HL may be less inclined to fill in a questionnaire or to answer to an interviewer because this task requires a certain level of literacy. Limited HL is usually associated with low general literacy and also with bad health status.
- Some migrants may have a low intrinsic motivation to participate in a survey in a "foreign country", Switzerland.
- There is a selection bias due to the fact that only households with a landline telephone are contacted in the surveys. As (Blumberg et al. 2006) show in the United States, this may lead to a serious selection bias which is especially important in the case of analysis on HL. Blumberg and Luke (2007) show that households with only wireless telephone tend to be young, poor and Hispanic. This should also be true in Switzerland where the diffusion of mobile telephony is higher than in the USA.
- Most of the surveys are only carried out in the three national languages. However 14% of the Swiss population speaks a mother language different from German, French or Italian (Federal Office of Statistics data for the year 2006). This is a conservative estimate because many of immigrants from Germany, Austria, France, Belgium and Italy live in a region where the local language is not their native language, e.g. Italians living in the German speaking part of Switzerland.

Future HL survey should focus specially on groups of people with limited HL and should also make an explicit effort to include a sufficient number of individuals of these groups.

2. The measurements of HL are mainly based on self-assessment questions. As revealed by the questionnaires with control questions, the self-assessed HL is often substantially overestimated compared to the true HL evaluated by direct cross-checking tests.

3. None of the six datasets described include both information on healthcare resource use and HL. However, the combination of information on health service use, HL and confounding factors is necessary in order to estimate the economic impact of limited HL.

Compared to the UNIVOX and the USI surveys, the ISPMZ survey seems to have some limitations concerning the measurement of HL. Whereas cross-check questions are required in order to verify whether questions on self-assessment are

over/under estimated by respondents, the ISPMZ survey includes only few of these checks. Note also that only part of the questions and results coming from the ISPMZ survey is reported in this report since we did not manage to obtain the questionnaire.

Generally, the results found by previous analyses are interesting since they allow us to identify the general level of knowledge of Swiss population regarding different health domains. They also give a first insight on the ability of the Swiss people to function in the health system. Nevertheless, further data should be collected and further analysis should be conducted to better understand interactive and critical HL in Switzerland. Moreover, none of the previous analysis focussed on the economic impact of limited HL in Switzerland. Yet, investigating the relationships between HL – or literacy – and health outcomes or healthcare resource utilization would raise awareness of the relative size of the economic costs associated with limited HL in the Swiss health system.

Although SHARE does not include explicit measurements of HL, one positive aspect of the survey is to include information on both health consumption and general health literacy. SHARE might contribute to the analysis of potential relationships between HL and health care utilization among a very sensitive population that constitute the elderly. Thus, SHARE data might contribute to the economic analysis of HL in Switzerland.

The ALL survey is a very valuable instrument to perform international comparisons on the various skills necessary in a modern society. However, the lack of this survey with respect to our purpose is that it does neither include information on health utilisation nor on health outcome (except self reported health). Combining the information of both the ALL survey and the SHS might give us the possibility to gain insights into the connection between HL and health care costs – or at least health care utilization – in Switzerland. The analysis of correlation between HL and health care costs could help us to assess the economic implications of limited HL. Note however, that this combination of information will implicitly lead to macro analysis. Section 2 will present a simple calculation of the economic impact of HL in Switzerland at a macro level.

1.4 Description of the six surveys

This section presents a description of each of the six surveys. It includes the main objective, technical aspects, type of data collected and a description of selected questions on HL or literacy.

1.4.1 Current health trends and health literacy in the Swiss population (gfs-UNIVOX)

Summary

The gfs-UNIVOX survey is conducted every two years since 1991 and covers 23 political, social and economic domains and health. The health module of the survey contains basic questions plus one specific focus that changes every year. In 2006/7, the specific focus was HL. A broad concept of HL including functional HL, interactive HL and critical HL was studied by Prof. Abel who was responsible for the HL part of the survey. The survey was financed by UNIVOX a private survey institute

Methodology

The interview including other UNIVOX subjects was based on a face to face interview of a total duration close to 45 minutes. Individuals interviewed were entitled to vote (thus older than 18 years old). However, the sample did not include foreigners. In September 2006, there were 705 completed individual interviews (75% of German speaking and 25% of French speaking part of Switzerland).

Non HL data items collected

- **Socio-demographic:** gender, age, language area, urban / rural area,
- **Economic status**: household income,
- **Education**: highest
- **Health status**: self reported health
- **Health care use:** none,
- **Other**: vote / non vote, sympathy for a particular political party.

HL specific items collected

- **Functional HL**
  - Knowledge on illnesses, number of wine per day that is not a threat to health,
  - Self rated understanding of information media or patient information leaflet and oral instruction in pharmacy,
  - Test on understanding a medicine information leaflet.
- **Interactive HL**
  - Self rated ability to communicate on your own health problems.
- **Critical HL**
  - Self assessment of critical thinking on the information media.

Selected questions on HL

- **Functional HL**

Q1 Can AIDS be cured?

Q2 Number of glasses of red wine per day that do not pose a threat to health?

Q3 Order food according to advisable frequency of consumption. The aim of this question is to determine if individual has correct knowledge of the nutritional pyramid.

Q4 In general, how well do you understand the information from newspaper articles / TV & radio / promotional material / patient leaflet / booklets on certain diseases / oral instructions in pharmacy?

Q5 The interviewer reads a patient information leaflet on Aspirin and asks a simple question: A person has taken 2 tablets at 8.00. At what time can the person take an other tablet?)

- **Interactive HL**

  Q6 How do you assess your ability to communicate with others if you have health problems?

- **Critical HL**

  Q7 How good are you in general in deciding which information from the media you can use and those you cannot? (“Wie gut können Sie allgemein unterscheiden, welche Informationen in den Medien Sie gebrauchen können?”).

  Q8 Are able to organise your daily life in a health way?

References

Wettstein et al. (2007)

Web site

http://www.gfs-zh.ch/ > Produkte > UNIVOX-Analysen

1.4.2 Nutrition, physical exercise and body weight – Opinions and perceptions of the Swiss population (USI)

Summary

The survey assessed opinions, perceptions and self-assessment regarding nutrition, physical exercise and healthy body weight. It also includes several questions measuring HL related to these fields. The survey was financed by Health Promotion Switzerland.

Methodology

The interviews were conducted on landline telephone with an average duration of 30 minutes. In total 1'441 individuals of age over 16 years were interviewed. Total gross sample included 7'000 regionally stratified phone numbers that were provided by Federal Office of Statistics. Numbers were called until required number of interviews was reached – each number was dialled up to 5 times. The questionnaire contains 58 questions.

Non HL data items collected

- **Socio-demographic**: gender, age, marital status, rural/urban, region, language of interview (not necessarily main language of interviewed), nationality (only 13.2% while national average is 20.7%).
- **Economic status**: none
- **Education**: highest education
- **Health status**: height, weight (they use it to build the BMI categories underweight / normal weight / overweight / obese),
- **Health care use:** none

HL specific items collected

- **Functional HL**
  - Knowledge on frequent diseases that can be caused by overweight, on healthy nutrition
  - Self rated ability of what a healthy nutrition or healthy physical activity is
  - Self rated ability to judge if own body weight is healthy
- **Interactive HL**
  - Frequency in communicating with others about weight problems
- **Critical HL**
  - Satisfied with body weight?

Selected questions

- **Functional HL**

  Q1 What are the most frequent diseases that can be caused by overweight?

  Q2 What is a healthy nutrition? (open question)

Q3 How good are you in deciding what is a healthy and what an unhealthy nutrition? Tell me how good you are on a scale from 1 (not good) to 7 (very good in deciding)

Q4 Regarding the subject of physical exercise. How good are you on deciding what is healthy and what is unhealthy?

Q5 Do you think you are able to judge, whether your body weight is healthy or unhealthy?

Q6 Do you think you are part of the people with an unhealthy body weight?

Q7 Do you believe that you have enough physical activity for your health?

Q8 Do you think that your eating habits are healthy, not so healthy or quite unhealthy?

Q9 Are you currently satisfied with your body weight? Are you completely satisfied, quite satisfied, not so satisfied, not satisfied alt all?

- **Interactive HL**

Q10 How often do you speak with other people about weight problems? How often do you speak with other people on the connection between physical exercise and health? Do you often speak with other people on problems regarding body weight?

References:

Schulz et al. (2007)

1.4.3 Health Literacy in Switzerland (ISPMZ)

Summary

This survey is a part of the future patient project which aims to assess how Swiss citizens and Swiss patients respond to the challenges of today's and tomorrow's health care system. In particular, the survey aims at measuring HL in its various components following OECD model. The Survey is financed by MSD Switzerland.

Methodology

The interview included 150 questions is an on landline telephone with a duration close to 30 minutes. 1'250 individuals aged 15 and over were interviewed in the 3 language regions (650 individuals in the German part, 300 in the French part, and 300 in the Italian part of Switzerland). Selection of participants in collaboration with professional survey institute based on telephone numbers. Stratification by age, gender and language region.

Non HL items

- **Socio-demographic variables**: gender, age, household size,
- **Economic status**: household income,
- **Education**: highest education degree
- **Health status**: size, weight (they use it to build the BMI categories underweight / normal weight / overweight / obese), Self reported health, physical health (chronic disease)
- **Health care use:** general practitioner (GP) visits, nights stayed in hospital, drugs utilization (prescription, over-the-counter)
- **Individual prevention and health promotion**: regular physical activity, eating habits.

HL specific items

- **Functional HL**
  - Self assessment of knowledge in different areas
  - Understanding of information given by GPs
  - Self assessment of the complexity of choosing a medication / a GP / a health insurance / a healthy diet.
- **Interactive HL**
  - Options of treatment given by GPs
  - Possibility to have an active role
  - Media used regarding health choices
  - Understanding of media information

- **Critical HL**
  - Reactions of patients on to their willingness to play an active role in decisions regarding their health

Selected questions dealing with HL

- **Functional HL**
  - **Q1** Do you usually understand information given by GP
  - **Q2** How do you self assess the complexity of choosing a medication
  - **Q3** Do you have enough information to choose the right GP or health insurance?
- **Interactive HL**
  - **Q4** Do GP suggest you different treatment options?
  - **Q5** Would you like to play a larger role in decisions regarding your health?
  - **Q6** Which of these media is the most important regarding your health choices? (print media, GP, internet, friends, radio and TV)
  - **Q7** How is it for you to understand the media information? (difficult, quite easy, easy)

References

Wang and Schmid (2007)

ISPMZ (2006), (2007)

1.4.4 Swiss Health Survey (SHS)

Summary

The SHS is a longitudinal study that provides information on health status of the Swiss population and its determinants, the implications of illness, the health care use and the insurance. The target population is defined in terms of individuals but information at the household composition is also collected. The survey is carried out by the Swiss Federal Office of Statistics.

Methodology

The sample includes 20'000 individuals and is representative for the Swiss population aged over 15 years. Based on probability samples, the survey consists in a two step interview. The first is based on a telephone interview using the Computer-assisted telephone interviewing method (CATI). The second is a self-completed questionnaire (drop-offs). The covered geographic areas are the large Swiss regions and certain cantons with a sufficient sample size. The survey started in 1992 and is conducted every 5 years. Data for 2007 will be available at the end of the current year.

Non HL items

- **Socio-demographic**: gender, age, household composition, marital status,
- **Economic**: income, profession, current work activity, security in employment,
- **Education**: education,
- **Health status**: accidents, handicap, temporary disability, illnesses, oral health, psychological health, self-reported health, health of children age<15 (breeding, accidents and handicaps),
- **Health care use:** health insurance, hospitalisation, general practitioner visits, specialist visits, home care in own home,
- **Individual prevention and health promotion**: physical activity, eating habits, tobacco and alcohol consumption, drugs utilization, cholesterol control, diabetes, blood pressure, HIV test, influenza vaccination
- **Other**: living conditions (housing**:** number of rooms, property), pollution, violence, social network.

HL specific items

- **Functional HL**
  - Importance given to health in general
- **Critical HL**
  - Satisfaction with the bodyweight
  - Willingness to loose some weight (questions asked to people age between 15 and 25 years old)
  - Importance given to health in general
  - Opinions on the role played by institutions regarding health
  - Difficulties preventing from having an health nutrition

Selected questions dealing with HL

Q1 En ce moment, êtes-vous satisfait(e) de votre poids corporel? Etes-vous ... très satisfait(e) / assez satisfait(e) / plutôt insatisfait(e) / très insatisfait(e) / pas de réponse

Q2 Quelle importance revêt la santé pour vous ? (Je vis sans me préoccuper particulièrement des conséquences sur mon état de santé. / Mon style de vie est influencé par des considérations relatives au maintien de ma santé. / Des considérations relatives à ma santé déterminent dans une large mesure ma manière de vivre.)

Q3 Les institutions et les groupes ne se considèrent pas tous comme responsables de la même manière vis-à-vis de la santé de la population. Parmi les institutions suivantes, quelles sont, à votre avis, celles qui devraient en faire moins pour la santé des personnes qui se confient à elles, et lesquelles devraient en faire plus? (l'école / les services médicaux / les assurances / l'industrie et l'artisanat / les communes / les cantons / la Confédération - Répondre: devraient en faire moins / en font assez- devraient en faire plus / ne sais pas)

Q4 De nombreuses personnes, dont vous faites peut-être partie, estiment qu'il est important de se nourrir sainement. Voyez-vous des obstacles pour quelqu'un voulant se nourrir sainement? (Cochez tout ce qui convient! les achats et la préparation prennent beaucoup de temps / l'offre dans les magasins est trop restreinte / l'offre dans les restaurants, cantines, etc., est trop restreinte / une alimentation saine est relativement chère / le manque de soutien de la part de mon entourage / mon entourage fait opposition / aimer bien manger / aimer beaucoup manger / habitudes et contraintes de la vie quotidienne / manque de volonté, pas convaincu(e) de l'efficacité)

Web site

http://www.bfs.admin.ch/bfs/portal/fr/index/infothek/erhebungen__quellen/blank/blank/ess/01.html

1.4.5 Survey of Health, Ageing and Retirement in Europe (SHARE)

Summary

SHARE is the first cross-national and longitudinal study providing information on health, socio-economic status and social and family networks of people aged of 50 and over in Europe. Inspired from the American and English longitudinal survey about health and retirement, the US Health and Retirement Study and the English Longitudinal Study respectively, the survey collects micro data on the life experience of more than 30,000 individuals distributed over various regions in Europe. Particpating countries in 2004/2005 (wave 1) ranged from Scandinavia (Denmark and Sweden) through Central Europe (Austria, France, Germany, Switzerland, Belgium, and the Netherlands) to the Mediterranean (Spain, Italy and Greece). Israel, the Czech Republic, Poland and Ireland have joined SHARE in 2006 (wave 2).

The Swiss survey is carried out by the Institute of Health Economics and Management (IEMS) at the University of Lausanne. The survey has been mainly funded by the European Commission through the 5th framework programme. Additionnal fundings are coming from the US National Institute on Ageing. The first wave data are already available. Data for the second wave will be available at the end of the summer. Data are free for people that have been previously registered as user.

Methodology

The target population of the SHARE is defined both in terms of households and in terms of individuals. Based on probability samples in all participating countries, SHARE represents the non-institutionalized population aged of 50 and over. The survey also includes spouses younger than 50.

The interview is based on a main questionnaire divided into 22 sections and either a self-completed questionnaire (drop-offs) or “Vignettes”. Computer-assisted personal interviewing (CAPI) method is used to fill in the main questionnaire.

Non HL items

- **Socio-demographic**: household composition,
- **Economic**: current work activity, job characteristics, opportunities to work past retirement age, sources and composition of current income, wealth and consumption, housing,
- **Education**: education
- **Health status**: self-reported health, physical functioning, cognitive functioning, health behaviour, psychological health, well-being, life satisfaction,
- **Health service use:** use of health care facilities,
- **Individual prevention and health promotion**: physical activity, tobacco and alcohol consumption,
- **Other**: social support (assistance within families, transfers of income and assets, social networks, volunteer activities)

Literacy items

- Self rated reading skills
- Self rated writing skills

- People's memory and ability to think about things
- Verbal fluency
- Numeracy

HL specific items

- **Functional HL**
  - Self-rated reading skills. Self rated writing skills. Numeracy
- **Interactive HL**
  - Verbal fluency
- **Critical HL**
  - Memory and ability to think about things

Selected questions dealing with Literacy

Q1 INTRODUCTION TEN WORDS LIST LEARNING: Now, I am going to read a list of words from my computer screen. We have purposely made the list long so it will be difficult for anyone to recall all the words. Most people recall just a few. Please listen carefully, as the set of words cannot be repeated. When I have finished, I will ask you to recall aloud as many of the words as you can, in any order. Is this clear?

Q2 VERBAL FLUENCY INTRO: Now I would like you to name as many different animals as you can think of. You have one minute to do this. Ready, go.

Q3 NUMERACY - CHANCE DISEASE 10 PERC. OF 1000: If the chance of getting a disease is 10 per cent, how many people out of 1,000 (one thousand) would be expected to get the disease? (Answers 100; 10; 90; 900; Other answer)

Q4 NUMERACY - HALF PRICE: In a sale, a shop is selling all items at half price. Before the sale, a sofa costs 300. How much will it cost in the sale? (Answers:150; 600; Other answer)

Q5 NUMERACY - 6000 IS TWO-THIRDS WHAT IS TOTAL PRICE: A second hand car dealer is selling a car for 6,000. This is two-thirds of what it costs new. How much did the car cost new? (9,000; 4,000; 8,000; 12,000; 18,000; Other answer)

Q6 NUMERACY - AMOUNT IN THE SAVINGS ACCOUNT: Let's say you have 2000 in a savings account. The account earns ten per cent interest each year. How much would you have in the account at the end of two years? (2420; 2020; 2040; 2100; 2200; 2400; Other answer)

Q7 TEN WORDS LIST LEARNING DELAYED RECALL: A little while ago, I read you a list of words and you repeated the ones you could remember. Please tell me any of the words that you can remember now?

Web site

http://www.share-project.org/

1.4.6 Adult literacy and life skills survey (ALL)

Summary

The purpose of the ALL survey is to determine how adults used printed information to function in society. The survey is a cross-sectional and cross national study that includes data on background information and psychometric results of respondents' skills along four domains: prose and document literacy, numeracy and problem-solving.

Seven countries or regions participated to the survey in 2003. They include Bermuda, Canada, Italy, Norway, Switzerland, the United States and the Mexican State of Nuevo Leon. In 2005 other countries participated to the second round of the survey: Hungary, Czechia, Australia South Chorea and Netherlands. The survey is carried out by the Swiss Federal Office of Statistics.

Methodology

The target population is defined in terms of households and adult individuals aged of 16 and over not residing in institutions.

The sample of stratified following 5 geographic regions (German speaking CH excluding the canton of Zurich, canton of Zurich, French speaking Swiss with the exclusion of canton of Geneva, canton of Geneva, Italian speaking canton).

Data available from Canadian web site.

Non HL items

- **Socio-demographic variables**: size of family, language, immigrant status, ethnicity, parental education and occupation
- **Economic**: income, occupation, industry, work status and history
- **Education**: education (extensive section), adult education and learning (extensive section), training
- **Health status**: mental and physical health
- **Health service use**: none
- **Other**: number of books at home, reading practices with children.

HL specific items

- **Functional HL**
  - Self-rated reading skills.
  - Self rated writing skills.
  - Workplace literacy.
  - Numeracy and problem-solving practices pertinent to HL
- **Interactive HL**
  - Information and communication technology use and familiarity
- **Critical HL**
  - Problem-solving practices in general and at home. Civic engagement

Literacy items

- Literacy uses, information and communication technology
- Linguistic information
- Self-assessment of reading and writing in mother tongue
- Workplace literacy
- Literacy and numeracy practices at home
- Information and communication technology use and familiarity
- Civic engagement

Web site

http://www.adult-literacy.admin.ch/

http://www.sidos.ch/fw_query/sidjweb2.fwx?htm.sel0=7746

http://www.statcan.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SDDS=4406&lang=en&db=IMDB&dbg=f&adm=8&dis=2#b1

2 Economic costs of low health literacy in Switzerland: a rough calculation

The systematic literature review carried out as part of this research project on the economic aspects of HL reveals that the costs of limited HL for the HC system may be substantial (Eichler et al. 2008). A Number of US studies points out this result (Friedland 1998; Weiss and Palmer 2004; Sanders et al. 2007; Vernon et al. 2007). Following the methodology of Friedland (1998), Spycher (2006) estimates that the costs of limited HL in Switzerland amount to CHF 1.5 billion in 2005. Compared to Spycher (2006), our calculation is based on a more recent and a better documented work by Howard et al. (2005) and on an extension of the cost model proposed by Vernon et al. (2007).

In order to investigate costs associated with limited HL in Switzerland, we combine three types of data: 1) data on HC costs in Switzerland, 2) data on levels of HL in Switzerland (see previous section) and 3) data on costs of low HL in the US.

2.1 Description of the cost model

The model illustrates the impact of limited HL on HC costs in Switzerland and can be easily modified to illustrate the effects of changes in the assumptions.

Per capita HC costs due to limited HL are expressed as a ratio of the average per capita medical expenditure for adults. This assures that total HC costs remain constant when model assumptions are changed.

Total HC expenditures published by the Swiss Federal Office of Statistics include different components of expenditures. The first step is to identify the HC cost components considered in the US studies on limited HL. We thus exclude the following four categories from the total Swiss annual amount of HC expenditures: 1) administrative and prevention expenditures which are not affected by limited HL, 2) costs of institutions for elderly 3) out-of-pocket payments for dental care, 4) HC costs of children and teenagers. Finally, the average per capita medical expenditures for the year 2005 amount to CHF 6'748. Table 4 (page 25) displays the details of the calculation.

Health care costs due to limited HL are modelled with the following variables:

1. **The portion of people with below basic HL is estimated at 13.0% in Switzerland and 22.3% in the US and the portion of people with basic literacy at respectively 33.8% and 32.2%.**[1]

   These levels are based on the ALL 2003 survey on general adult literacy which distinguishes four levels of literacy (proficient, intermediate, basic, below basic) (OECD 2005). These literacy levels are calculated by taking the average of the population fractions with the same level of literacy in three literacy domains of prose, document and numeracy (table 5 page 26).

[1] It may be helpful to have an idea of the difficulties individuals with these levels of literacy have with health related information and tasks: „Below basic health literacy would not be able to recognize a medical appointment on a hospital appointment form, nor would they be able to determine from a clearly written pamphlet containing basic information how often a person might have a specified test. Persons with basic health literacy would have trouble providing two reasons why someone with certain symptoms might have a specified test, even when they used information from a clearly written, accurate pamphlet." (Vernon et al. 2007)

The distinction of two levels of limited HL is convenient because the impact of limited HL on HC costs can be varied between the two levels.

2. **HC costs are 20.7% higher than average for individuals with *below basic* HL and 6.5% higher for individuals with basic HL**. The figures are based on the results of Howard et al (2005), who distinguish individuals with *inadequate HL* and *marginal HL*.

   According to Friedland (2002), a 20% share of the population with the lowest levels of HL has average HC costs that are +96% higher than the average HC costs of the whole population. However, this magnitude appears excessive in light of other studies on the HC costs of HL.

3. **Only 64% of the difference in HC costs of individuals with limited HL to individuals with adequate HL is attributable to limited HL.** The remaining part of the cost difference is not due to *limited HL* but to confounding factors, such as a lower than average health status. This figure is based on the estimations by Howard et al. (2005). A critique of the frequently cited estimation of HC costs due to limited HL by Friedland (1998) is that he does not control for these confounding factors.

Table 4: Calculation of average per capita HC expenditures of adults in 2005

		value 2005	source
	Total annual HC expenditures	52’697 m CHF	S1
−	Total **costs that are excluded** (cost categories: administrative costs, prevention expenditures, costs of institutions for elderly, out-of-pocket payments for dental care)	10’634 m CHF	S1
=	Total HC costs	42'064 m CHF	S1
−	HC costs for population with age between 0 and 19 years	3'315 m CHF	S2
=	HC costs for population with age ≥ 20 years	38’751 m CHF	S2
/	adult population	5.74 m individuals	S2
=	average per capita HC expenditures of adults	**6’748 CHF**	

HC: health care

S1: Kosten und Finanzierung des Gesundheitswesens nach Leistungserbringern und Direktzahlenden 2005, Bundesamt für Statistik

S2: Gesundheitskosten nach Alter und Geschlecht 2005, Bundesamt für Statistik

m: million

Table 5: Adult population in % at literacy levels 1 and 2 (ALL 2003)

	Switzerland			USA			CH / USA		
level	1	2	1+2	1	2	1+2	1	2	1+2
prose	15.9	36.3	52.2	20.0	32.6	52.6	0.80	1.11	0.99
document	14.5	34.5	49.0	20.2	32.3	52.5	0.72	1.07	0.93
numeracy	8.6	30.7	39.3	26.8	31.8	58.6	0.32	0.97	0.67
average	**13.0**	**33.8**	**46.8**	**22.3**	**32.2**	**54.6**	**0.58**	**1.05**	**0.86**

level 1: below basic literacy
level 2: basic literacy

source: OECD (2005)

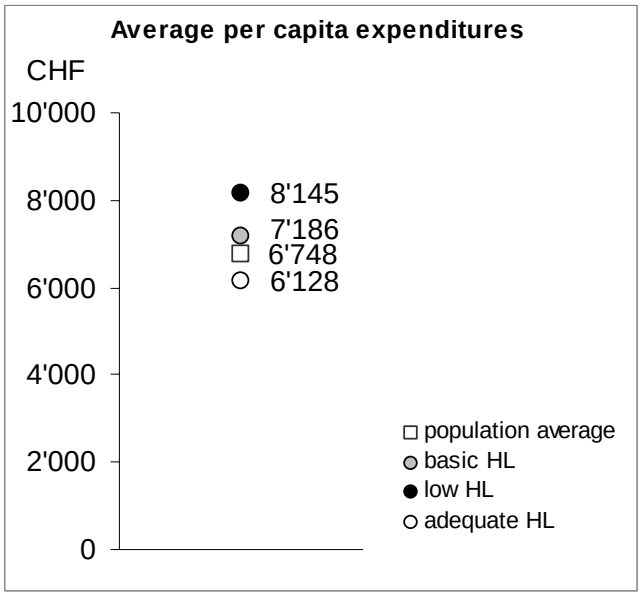
2.2 Results

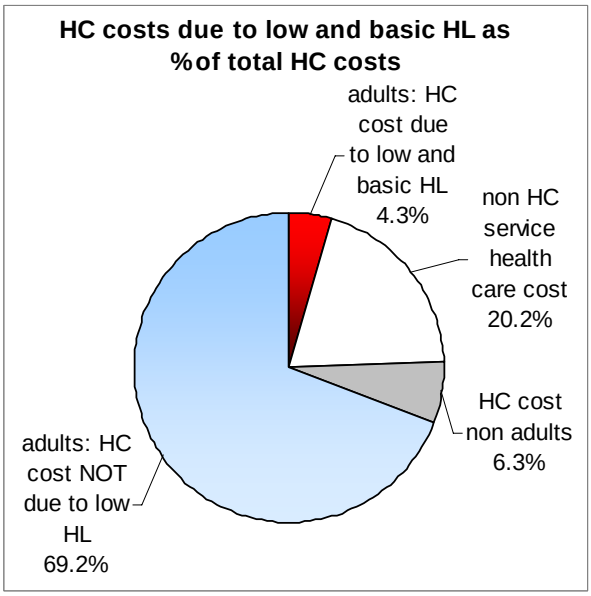
The results of our base scenario, which is calculated on the assumptions described in the previous section, are shown in figure 1. With average per capita HC costs of individuals with adequate HL of 6'128 CHF, average HC costs amount to 8'145 CHF (+2'017 CHF) for individuals with low HL and to 7'186 CHF (+ 1'059 CHF) for individuals with basic HL (see screenshot page 33 for details). The difference is higher than the difference between individuals with low HL and the population average (1'397 CHF or 20.7%) because HC costs of individuals with adequate HL are *below* the population average. Note that only 64% of this cost difference can be attributed to low HL and that the net HL cost differences thus amount to 1'291 CHF for low HL and 678 CHF for basic HL.

Consequently, total annual HC costs attributable to low HL in Switzerland amount to 2'279 billion CHF representing 4.3% of total HC expenditures (52.7 billion CHF) in 2005.

The cost model is very sensitive to changes in the assumptions. If we take the assumptions of the base scenario in Vernon et al. (2007) which assume a cost difference to average HC costs of 28% for all individuals with low and basic HL and 50% of this cost difference attributable low or basic HL we have the following result: the net cost difference attributable to low HL amounts to 35% of HC cost of individuals with adequate HL and total costs of low and basic HL amount to 4'772 billion CHF or 9.1% of total HC expenditures (see screenshot page 34 for details).

Figure 1: Results base scenario





2.3 Discussion of the cost model

The costs of limited HL in Switzerland calculated on an extrapolation of US-data appear to be substantial. This result is based on conservative assumptions, since we exclude a part of HC expenditures and the HC costs of children and adolescents from the model. Moreover, we only considere direct medical costs while the total social costs would also include indirect costs (lost production / income) and intangible costs (quantity and quality of life years).

The model is very sensitive to changes in the assumptions. These results may vary considerably when changing the assumptions regarding the association between limited HL and HC costs.

The most important limitation of our exercise is the lack of information on the relationship between limited HL and HC costs in Switzerland. The few US-studies available show that limited HL is associated with higher HC costs. However, we do not know if this holds for Switzerland. There are indeed many differences between the Swiss and the US health care systems that may affect the results. In particular, the mandatory health insurance in Switzerland, the special role of Medicare in the US, differences in the cost structures and in the cultures may lead to different results.

In order to correctly investigate the impact of limited HL on HC costs in Switzerland, further analysis based on Swiss data on the relationship between HL and HC costs is required. Ideally this analysis would be based on a representative sample of the population including micro (= patient level) data on HC costs, HL and health conditions. The inclusion of individuals with a high propensity to limited HL, such as migrants, individuals with low income and the elderly should be considered with a particular attention.

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Abbreviations

ALL	Adult literacy and life skills survey
BMI	body mass index
GP	general practitioner
HC	health care
HCC	health care cost
HL	health literacy
ISPMZ	Institut für Sozial- und Präventivmedizin Zürich
MSD	Merck Sharp & Dohme-Chibert AG
SHARE	Survey of Health, Ageing and Retirement in Europe
SHS	Swiss Health Survey
USI	Università della Svizzera Italiana

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Appendix: Screenshots cost model

Figure 2: Screenshot cost model - base scenario

Cost model Switzerland

Model input

C_A	6'748	average per capita medical expenditures (CHF)	base scenario
Q	5.74	adult population (>=age 20) (million)	Vernon et al. (2007)
Q_L	0.75	n. of individuals with low HL (million)	
Q_B	1.94	n. of individuals with basic HL (million)	
p_L	13%	share of pop with below basic HL	
p_B	34%	share of pop with basic HL	
p_L+p_B	47%		
h	20.7%	additional HCC of individuals with low HL / average total HCC	
k	6.5%	additional HCC of individuals with basic HL / average total HCC	
a	64%	share of higher costs with low HL attributable to low HL and not to other factors	
	38'751	total annual HC expenditures (adults, million CHF)	
	52'697	total annual HC expenditures (whole Population, million CHF)	

Average direct medical expenditures for adults in CHF

	p.capita	total (mio)	
C_L	8'145	6'080	with low HL
C_B	7'186	13'949	with basic HL
C_N	6'128	18'721	with non low or basic HL
		38'751	

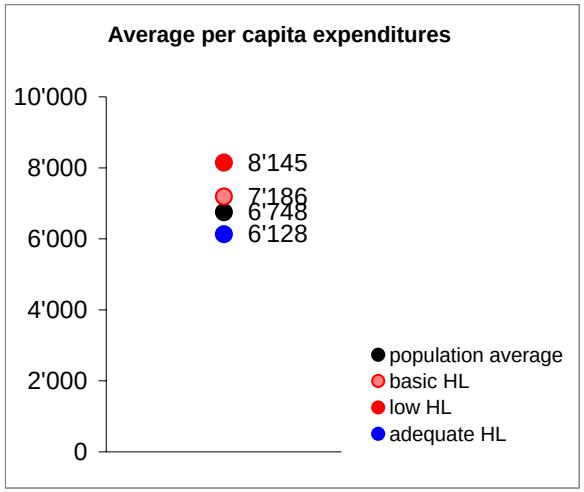
Cost differences per capita health care relative to non low nor basic

	CHF	%	
ΔC_L total	2'017	32.9	total
ΔC_{LHL}	1'291	21.1	due to low HL
ΔC_{LnonHL}	726	11.8	not due to low HL
ΔC_B total	1'059	17.3	total
ΔC_{BHL}	678	11.1	due to low HL
ΔC_{BnonHL}	381	6.2	not due to low HL

red	given poulation and cost data
red yellow	exogenous for senitivity analysis
blue	calculated by model

total cost

2'279	annual health care cost attributable to low HL (mio CHF)
36'472	costs non attributable to low HL (mio CHF)
5.88%	share of total HC costs of adults attributable to low HL
4.32%	share of total HC costs of total population attributable to low HL



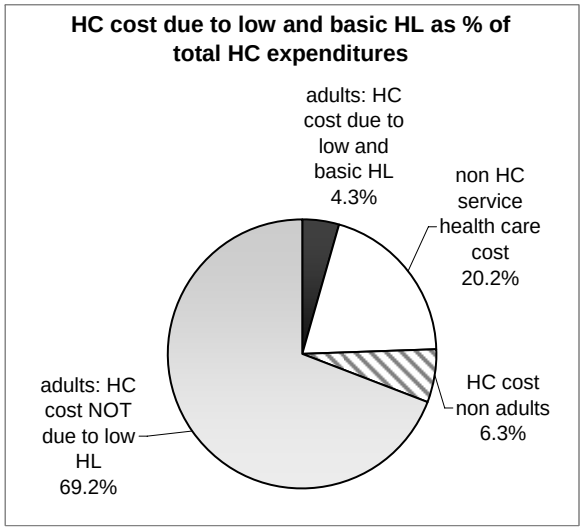


Figure 3: Screenshot cost model - scenario Vernon et al.

Cost model Switzerland

Model input

C_A	6'748	average per capita medical expenditures (CHF)
Q	5.74	adult population (>=age 20) (million)
Q_L	0.75	n. of individuals with low HL (million)
Q_B	1.94	n. of individuals with basic HL (million)
p_L	13%	share of pop with below basic HL
p_B	34%	share of pop with basic HL
p_L+p_B	47%	
h	28.0%	additional HCC of individuals with low HL / average total HCC
k	28.0%	additional HCC of individuals with basic HL / average total HCC
a	50%	share of higher costs with low HL attributable to low HL and not to other factors
	38'751	total annual HC expenditures (adults, million CHF)
	52'697	total annual HC expenditures (whole Population, million CHF)

base scenario
Vernon et al. (2007)

Average direct medical expenditures for adults in CHF

	p.capita	total (mio)	
C_L	8'637	6'448	with low HL
C_B	8'637	16'765	with basic HL
C_N	5'086	15'538	with non low or basic HL
		38'751	

Cost differences per capita health care relative to non low nor basic

	CHF	%	
ΔC_L total	3'551	69.8	total
ΔC_{LHL}	1'776	34.9	due to low HL
ΔC_{LnonHL}	1'776	34.9	not due to low HL
ΔC_B total	3'551	69.8	total
ΔC_{BHL}	1'776	34.9	due to low HL
ΔC_{BnonHL}	1'776	34.9	not due to low HL

red	given poulation and cost data
red yellow	exogenous for senitivity analysis
blue	calculated by model

total cost

4'772	annual health care cost attributable to low HL (mio CHF)
33'978	costs non attributable to low HL (mio CHF)
12.32%	share of total HC costs of adults attributable to low HL
9.06%	share of total HC costs of total population attributable to low HL