Online human health risk assessment and management: an in-silico approach

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The Risk Process is a combined effort of Risk assessment, Risk Management and Risk Communication.

- A systemic approach to characterize the nature and concentration of risks associated with any health hazard.
- Possible restoration of health by utilizing scientific and technical knowledge.
- An interactive process of exchange of information among individuals, groups and institution involved in the process.

Need of HHRAM

- Was always a necessity for the survival and evolution of human kind.
- But now with increasing environmental, social and occupational complication it becomes an elementary constraint.
- Additionally, our behaviors such as lack of exercise, smoking, imbalanced dietary habits, non-prescribed medication and extended working hours are rising its need.
- Some time general knowledge of risks does not always change behavior and we don't necessarily know that which of them needs most attention.
Complete elimination of risk from life is never possible.

But may be reduced to the level of tolerability by systemic approaches like HHRAM.
HHRAM through Internet

Today, in electronic age internet is increasingly being used as a source of information in all over the world.

It is estimated about 6,845,609,960 users in 2010 i.e. 28.7% penetration on world population with tremendous 444.8% growth between 2000-2010 (www.internetworldstats.com)

It's been treated as a major source of health information now days.

Various website viz. www.realage.com, www.healthstatus.com etc. are offering online HHRAM and working as dependable source in European countries.
Online HHRAM in India

Not any striking approach addressing to Indian population are available so far.

While European approaches due to different orientation are not suitable for the country like India where circumstances are entirely different.

India is also a leading user of internet (evidenced by fourth rank of India among world’s top 20 internet user countries).

Since, being mosaic of pluralistic diversity we may not be an exception for human health risks.

Therefore, an online HHRAM approach addressing to Indian population was attempted to develop in present investigation.

More than 1500 individuals’ health risks have been assessed and managed so far.
Experimental design

Step-1
- Designing and development of an online health risk assessment questionnaire

Step-2
- Designing and development of database management system and bio-calculators

Step-3
- Designing and development of a website for risk communication

Step-4
- Uploading the developed tool on website for online HHRAM

Step-5
- Online risk assessment and risk report generation for every end user
Step-1: Designing and development of online HRA questionnaire

- Microsoft DOT NET and MySQL application software were used.
- Developed to get better sampling implications, response rates and quality of data.

Screen shot of online health risk assessment Questionnaire (Section-‘A’: Personal History)
Step-2: Designing and development of database management System (DBMS)

Software and programming used
- Microsoft .NET version 3.5 and MySQL
- Macromedia Dreamweaver for outlook designing
- SPSS for data calculation.
- Modular programming (MP)

Note- MP facilitates the program breakage into modules, each of which perform one function and contains all the codes and variables needed to get done that function.

- Developed to produce realistic risk assessments and management
- The finding details were prepared and presented as risk report to every end user in a clear and logical manner.
Step-2 : Designing and development of Bio-calculators

- Developed with the help of C++, SPSS and JavaScript.
- Software used for outlook designing were Macromedia Dreamweaver and Macromedia flash player.
- Developed to ease the data analysis and quick data interpretation.
Step-3: Designing and development of website

The application software used were

a. Macromedia Dreamweaver
b. Macromedia Flash player
c. Microsoft Front page and
d. Microsoft office
e. etc.

Developed for worldwide communication and utility of the approach.
Step-4: Uploading the tool on website

- Bio-calculators
- Free health risk assessment
- Health status
- Protocols and web linked list of Journals related with science
- Health Survey
- Science updates

www.healthrisk.co.in

HHRAM
Step-5: Online health risk assessment and risk report generation for every end user

- Crafted as per analysis of users’ information.
- Meaningful reports on ‘well/at risk’ population.
- Promoting to better strategic planning and trend identification.
- May further support to cost savings and better health outcomes.
Worth

May be useful into predicting the health risk.

May be valuable for targeting wellness programme and incentive strategies.

May be useful to reinforce the importance of adhering to treatment plans and medication.

Proposed suggestions may be very effective if applied deliberately.
Total 58 questions were divided in four major sections
Personal history, Environmental status, occupational health status and socio-economical status

Online questionnaire form.
The end points related to followings may be calculated accurately in just one click.

- Oxidative Stress
- Statistical analysis

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Database management System (DBMS)

various data tables existing in ‘Database Management System’
Today, rapid scientific and technological advancements in nearly every sector are resulting in comfort and high living standard. At the same time, range of health hazards which are posing or may pose the health risks to environment and human beings are also added. Though, many human health risk assessment and management approaches are employed to reduce the health risks in European countries but due to entirely different circumstances are found incompatible in India. Therefore, in the present investigation efforts are made to develop a predictive In-silico tool for human health risk assessment & management and ehealth survey of Indian population. Since, risk communication is an important step of risk process and internet is better mode of communication now days hence the entire investigation is communicated worldwide through this website to attain the goal. Additionally, the bio-calculators developed during the study and uploaded here may provide a subtle platform to carry out complex experimental calculations related with various body indexes in fraction of minute.
Benefits; may be taken from website

- Free health risk assessment and management
- Health survey of the population living in any particular locality of India
- Tedious calculations related to various body indexes may be done in just one click by uploaded Bio-calculators.
- Health status assessment
  a. Disease based
  b. Occupation based
Health survey form

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Institute of Biomedical Sciences, Bundelkhand University, Jhansi

Health Survey Form

Country: Uganda
State: 
City: 
Id: 
Age: 

Educational background:
Academic: 
Technical: 
Professional: 

Your religion:
Hindu 
Muslim 
Christian 
Other: 

Income:
Person's Income: 
Total family Income: 
Total earning members: 
Per capita Income: 
History of family: 

Are you currently employed: Yes No

Do you eat only vegetables: Yes No

How do you prefer your meat cooked:
Rare Medium Well cooked

Do you drink coffee: Yes No

If Yes (Quantity): 

Do you drink tea: Yes No

If Yes (Quantity): 

Menu
HOME
ABOUT US
BIO-CALCULATORS
PROTOCOLS
DATABASES
JOURNALS
INSTITUTIONS
NEWS
FAQ'S
CONTACT US
Gallery
Disease based Health status assessment
Questionnaire for Diabetes

Questions related to Diabetes

**Type 2 Diabetes Health Assessment**

Your present lifestyle choices can affect your risk of developing diabetes. Find out your risk by taking this free health quiz.

One third of people who have diabetes don't know it, but careful management can lessen its effects on your vision, kidneys, and heart.

**Do You Have Diabetes?**

- **Has a healthcare practitioner told you that you have type 2 diabetes?**
  - yes
  - no

**Height**

- **feet**
  - 1 feet
- **inches**
  - 1 inches

**Weight**

**How much do you weigh?**

- **Pounds**

**Blood Glucose Value**

**What is your average blood glucose value before you eat a meal?**

- Less than 80 mg/dL
- 80 to 120 mg/dL
- 121 to 140 mg/dL
- Over 140 mg/dL
- I don't know what my average blood glucose value is before I eat a meal.

**Hemoglobin A1c Value**

- Less than 7%
- 7% to 8%
- Greater than 8%
- I don't know what my HbA1c value is.

**Blood Pressure**

**What is your blood pressure?**

- **Systolic**
- **Diastolic**

**Total Cholesterol**

**What is your total cholesterol value?**

- Less than 200
- 200 to 240
- Over 240
- I don't know what my total cholesterol value is.

**Submit**
Occupation based health risk assessment
What other on website???

- Experimental protocols related to science and over 2500 scientific journals with their active web link.
- Detailed information with active web link of nearly all recognized and reputed science Institutions, Universities and Colleges of India.

Worth

- May be used by students to retired persons searching for education and research in India and/or willing to know and manage their health risks well in advance.
Users are subsequently increasing with time.
Benefits to the society

- May be used to assess potential health effects of environmental, occupational and socio-economical health hazards present around us but lacks experimental toxicity data.
- May be used at individual to community level for health risk assessment and management.
- Not only researcher even students, private sector, various regulatory agencies (state/provincial) and most importantly every common man may take...
Conclusion

However, attempts are made in the present investigation to develop an umbrella approach to significantly assess and manage the health risks of Indian population.

But due to accidental nature of exposure it changes considerably which is tough to cover in limited approaches.

Combined scientific and technical approaches at larger scale are additionally required to effectively evaluate and manage the health risks of us.
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