



생활 환경 시스템

Built Environment System and Technology (BEST)

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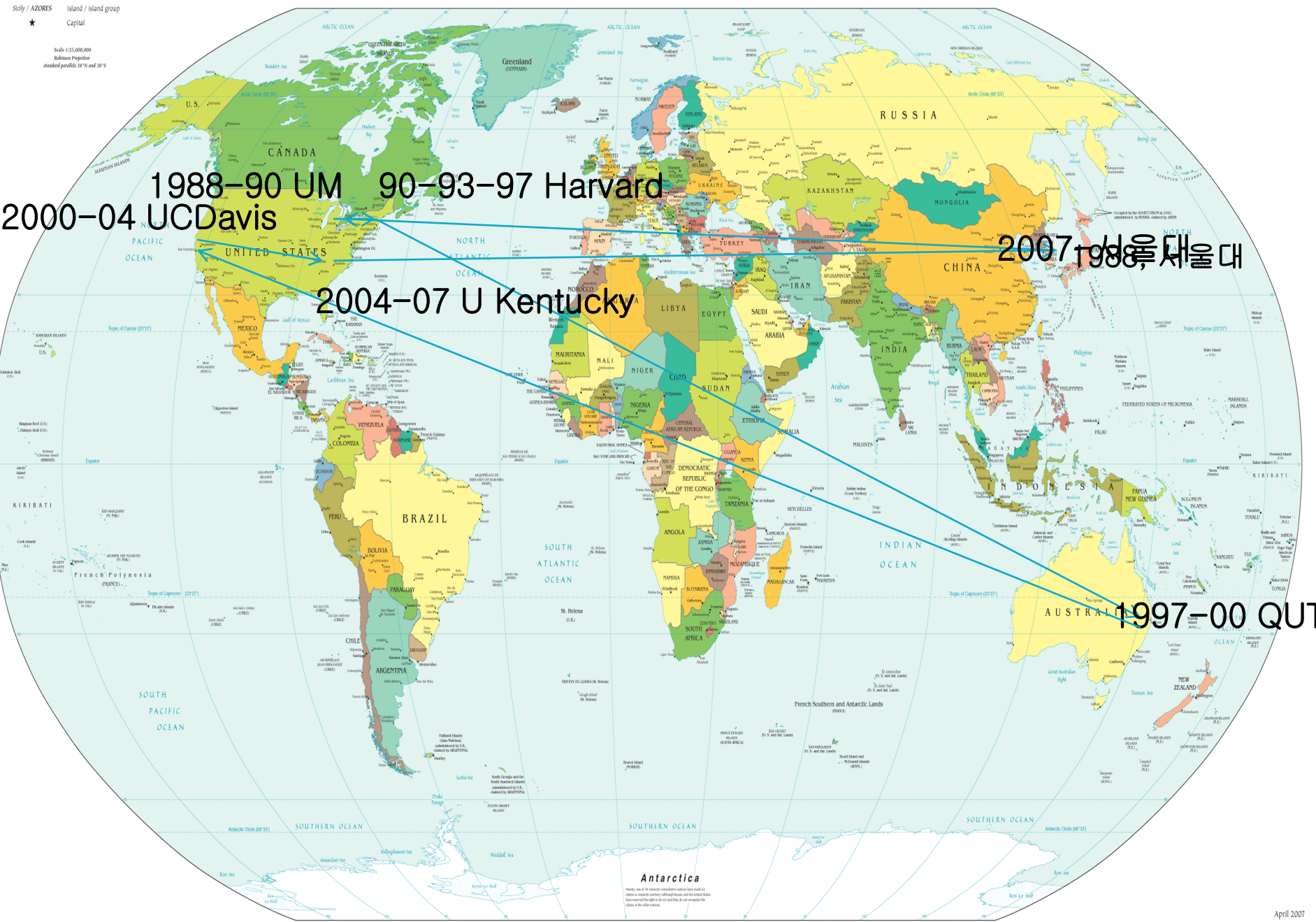
Political Map of the World, April 2007

AUSTRALIA
Bermuda
St. Helena
★

Independent state
Dependency or area of special sovereignty
Island / island group
Capital

Scale 1:35,000,000
Bathymetric projection
standard parallels 30°N and 30°S

1988-90 UM
2000-04 UCDavis
1988-90 서울대
2004-07 U Kentucky
2007-1988 서울대
1997-00 QUT



Health (건강)



○ Survival (생존에 필요한 인자)

- 물 (limited commodity)
- 음식 (limited commodity)
- 공기

○ Requirement for healthy living (건강에 필요한 인자)

- 깨끗하고 충분한 물 (Clean and sufficient water)
- 깨끗하고 적절한 먹거리 (Clean and healthy food)
- 깨끗한 공기 (clean air)

Price of a life: Priceless

Definition of Environmental Health



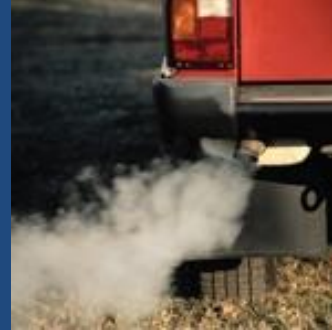
- Environmental health sciences represent the **study of environmental factors** including biological, physical and chemical factors **that affect the health of a community.**
- This is theory and practice of **assessing, correcting, controlling, and preventing** those factors in the environment that may adversely affect the health and well-being of present and future generations.



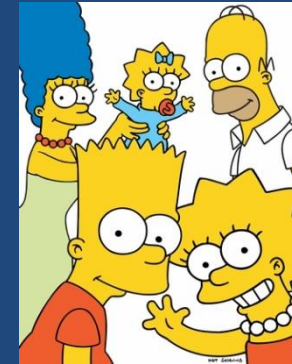
Routes of pollutants

오염 경로

○ 오염원 - Source

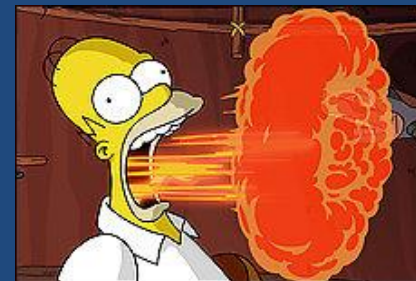


○ 전달 - Transport/transform

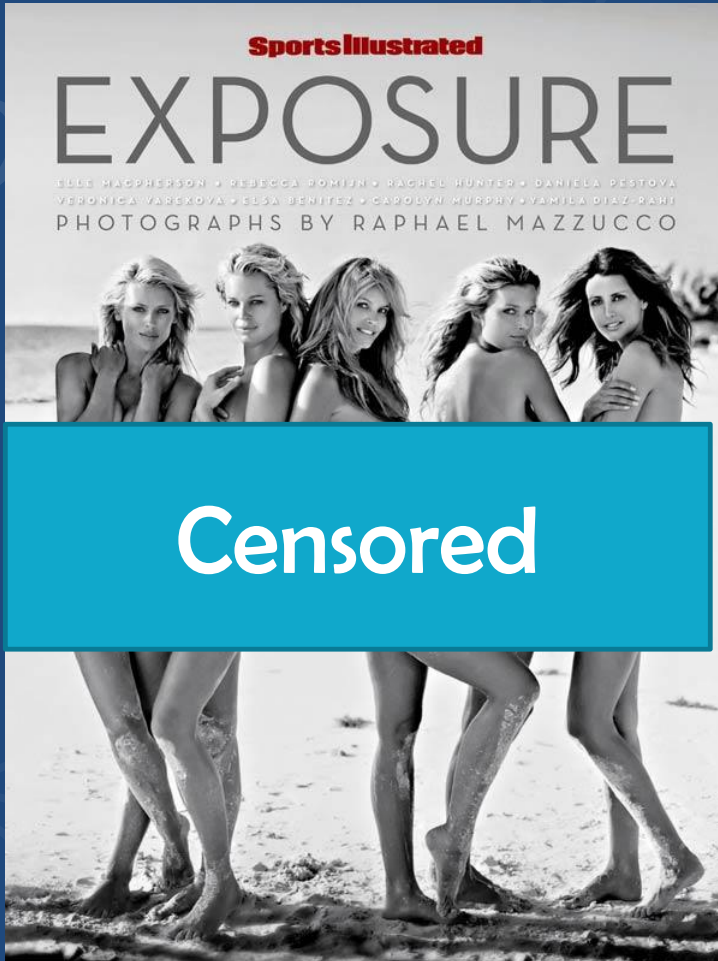


○ 수용체 - Receptor (human)

○ 건강영향 - Health effects



What is exposure (노출이란)?



Definition of Exposure (노출의 정의)

○ Contact of a biological receptor with chemical/physical agent (including biologically generated agent).

○ 수용체와 환경인자(화학, 물리, 생물학적)의 접촉

Exposure Assessment (노출 평가)?

Assessment and Control



Exposure Assessment (노출평가의 정의)

- Determining how an environmental pollutant comes into contact with the human body
- 환경오염물질이 인체와 얼마나 접촉이 되었는지를 평가하는 것



질문하세요



Exposure equation (노출공식)

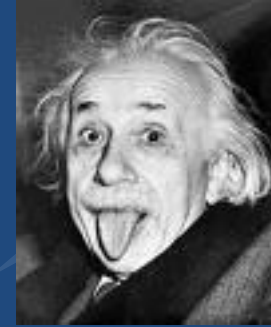
$$E = C \cdot T$$

- E = Exposure (노출)
- C = Concentration (농도)
- T = Exposure time (접촉시간)

$$E=mc^2$$



- Who?
- Einstein



- E: energy = m (mass) x c (speed of light)²
- What does it mean?
 - Matter can be turned into energy, and energy into matter.
- What does it imply?
 - Nuclear energy (Manhattan project)



$$E = C \cdot T$$



○ Who?

○ Kiyoung Lee



○ E (exposure) = C (concentration) \times T (exposure time)

○ What does it mean?

○ Exposure is associated with concentration in exposure media and the time subject spend in the media.

○ What does it imply?

○ Exposure Science

중요 (!!!)

왜 공간과 시간이 중요할까?



노출평가의 목적 (Purpose of Exposure Assessment)

- 특정인구를 유해로부터 보호하기 위해서 **Protect population from risk to certain pollution** (궁극적 목적)
- Examine long-term effects of emission control strategies on the exposure to a contaminant in the general population
- Provide information on exposure magnitude and variance in order to plan and design additional studies
- Compare exposure levels between various groups of a population
- Identify high-risk groups
- And more..



Exposure Science (노출평가)

What

- 노출 (Exposure)
 - 정도 (magnitude)
 - 빈도 (frequency)
 - 기간 (duration)
 - 노출경로 (route)

How?

- 측정 (Determination)
- 추정 (Estimation)

Exposure Path (노출경로)

- 흡입 Inhalation - Air
- 섭취 Ingestion
 - Food
 - Water
 - Soil
- 피부접촉 Dermal Contact



질문하세요



Competencies of MPH



Environmental health sciences represent the study of environmental factors including biological, physical and chemical factors that affect the health of a community.

- Describe the direct and indirect human, ecological and safety effects of major environmental and occupational agents
- Describe genetic, physiologic and psychosocial factors that affect susceptibility to adverse health outcomes following exposure to environmental hazards.
- Describe federal and state regulatory programs, guidelines and authorities that control environmental health issues.
- Specify current environmental risk assessment methods.
- Specify approaches for assessing, preventing and controlling environmental hazards that pose risks to human health and safety.
- Explain the general mechanisms of toxicity in eliciting a toxic response to various environmental exposures.
- Discuss various risk management and risk communication approaches in relation to issues of environmental justice and equality.
- Develop a testable model of environmental insult.

Source: <http://www.aspph.org/educate/models/mph-competency-model/>

질문하세요

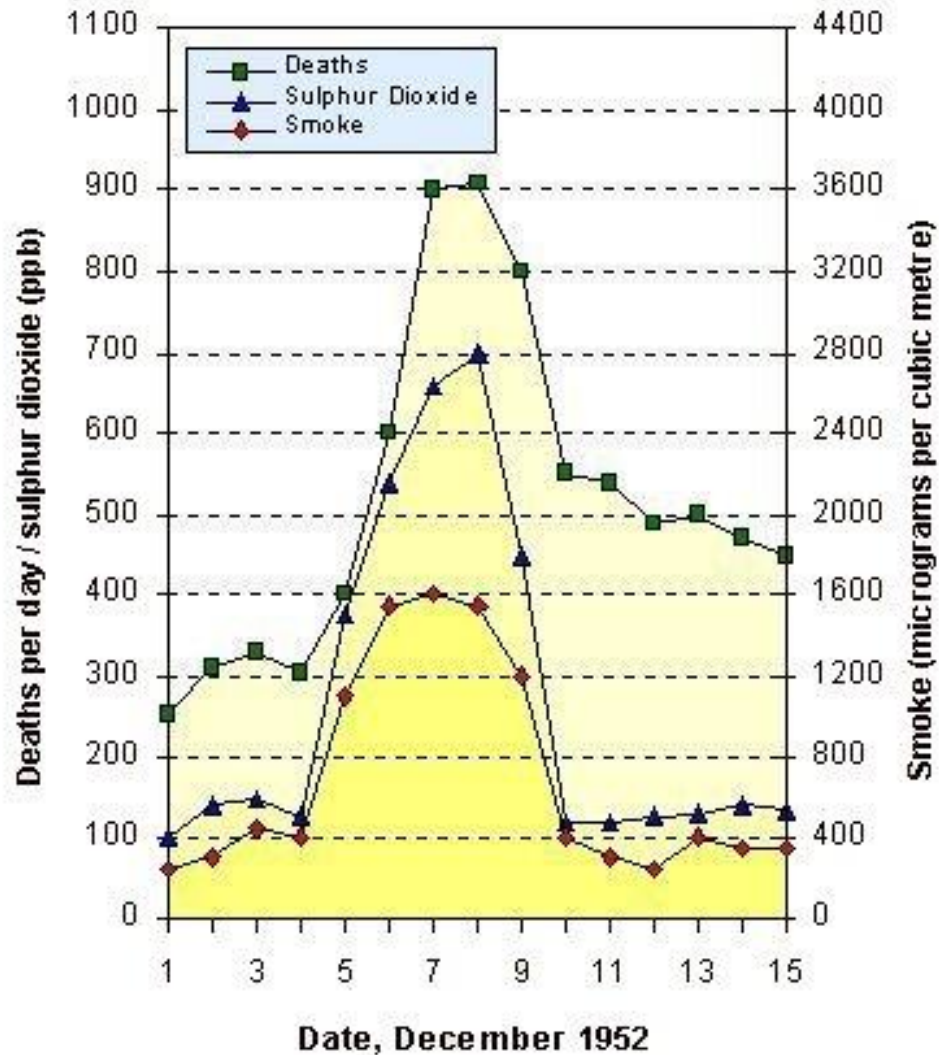


London Smog in 1952



Air pollution kill!

London smog



Perception of air pollution



Reality



- People spend a significant percentage of time indoors.
- Indoor concentrations are often higher than outdoor level.
- Large percentage of the overall exposure to some toxic chemicals may occur in indoor environment.
- The air we breath indoors can lead to significant short-term and long-term health effects



실내 환경의 노출 수준

(exposure in indoor)



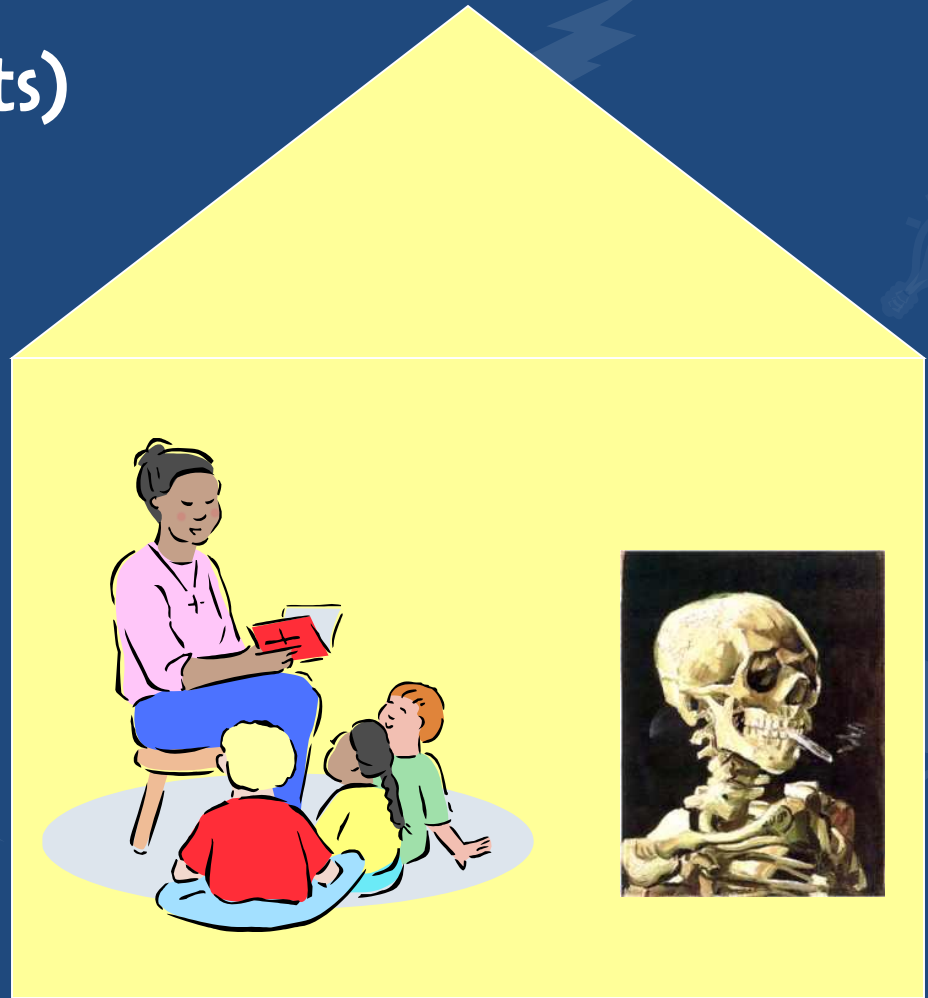
- People spend an average of 90 percent of their time indoors while some at-risk subgroups such as the elderly, very young, and chronically ill may spend nearly all their time indoors.
- Indoor levels of many potentially toxic organic compounds are typically 2 to 20 times greater indoors than outdoors. The ratio is sometimes as much as hundreds of times.
- Exposure in indoor can be 20-200 times more than exposure in outdoor
- 실내에서의 노출은 실외보다 20-200배 더 클 수 있다



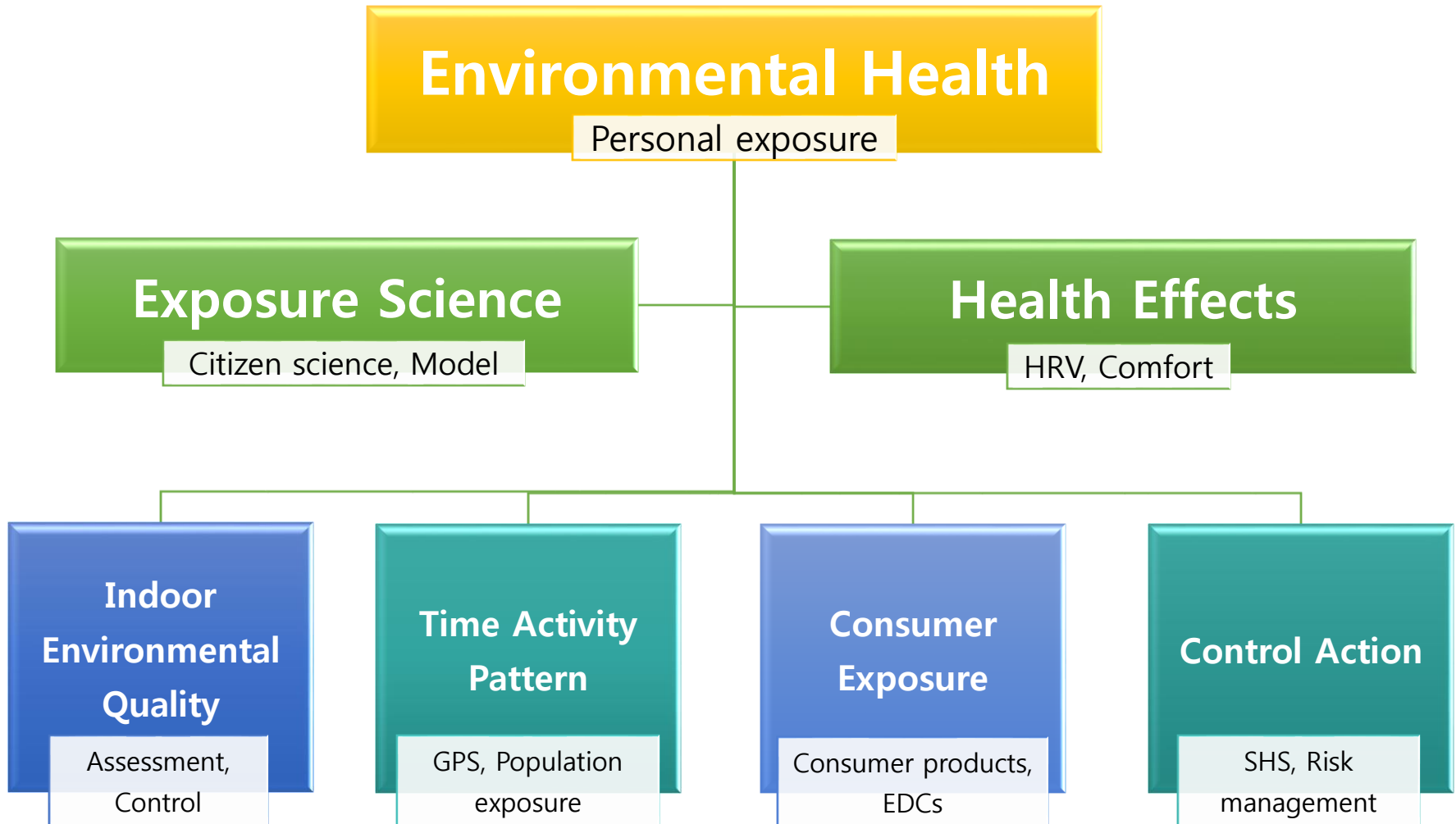
실내 환경의 이해

⌋⌋ (understanding indoor environment) ⌋⌋

- 건물 (Building)
- 거주자 (Occupants)
- 오염원 (Source)



Built Environment System and Technology (BEST) 생활환경시스템



질문하세요



Secondhand smoke

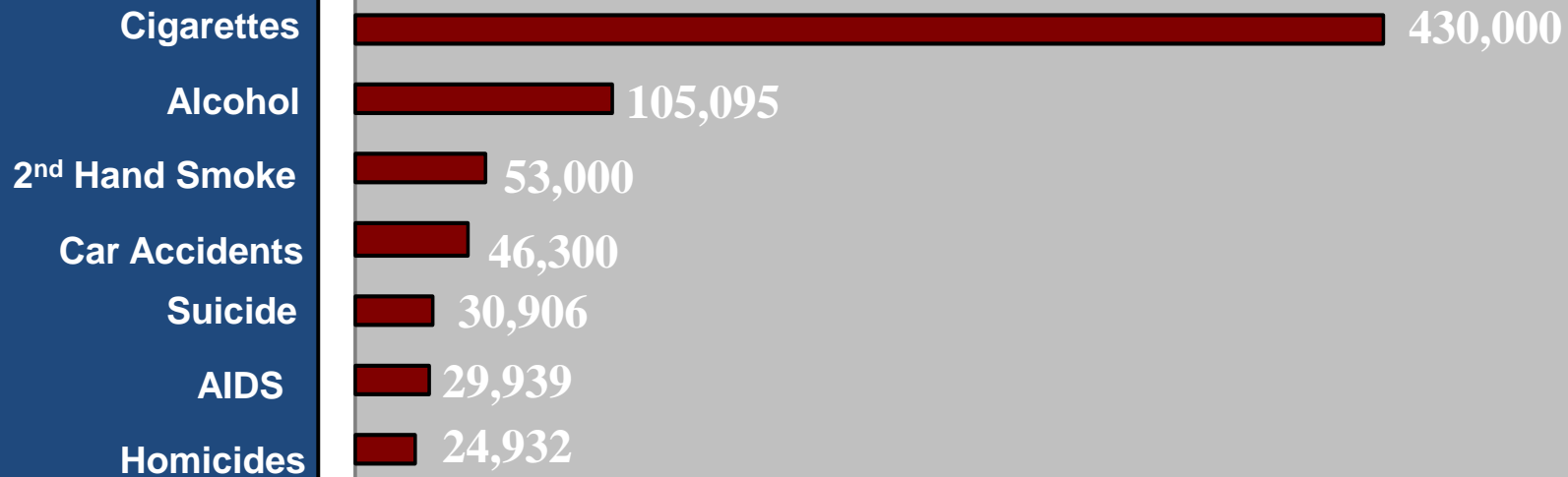


- What is secondhand smoke?
 - Mainstream and Sidestream
- Passive smoking
- ETS (Environmental Tobacco Smoke)
- SHS (Secondhand Smoke)



Nothing Kills Like Tobacco

Yearly Deaths in the U.S.A.



Source: Centers for Disease Control and Prevention (CDC)

Is Secondhand Smoke a Mere Annoyance?

- Secondhand smoke causes approximately 3,000 lung cancer deaths per year in nonsmoking adults.**
- Secondhand smoke causes approximately 46,000 heart disease deaths per year in nonsmoking adults.**
- Secondhand smoke causes approximately 430 SIDS deaths per year in newborns.**

Source: U.S. Surgeon General, 2006

Why do we need smoke-free policy?

- Housing
- Inhabitants
- Source



Surgeon General's report

The Health Consequences of Involuntary Exposure to Tobacco Smoke

A Report of the Surgeon General



Department of Health and Human Services

“The simple separation of smokers and nonsmokers within the same air space may reduce, but does not eliminate, the exposure of nonsmokers to environmental tobacco smoke.”

Impact of smoke free policy



Indoor air quality

Health effects

Public Health



Local economy

질문하세요

