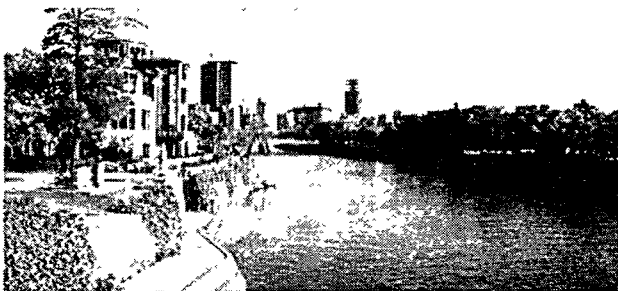


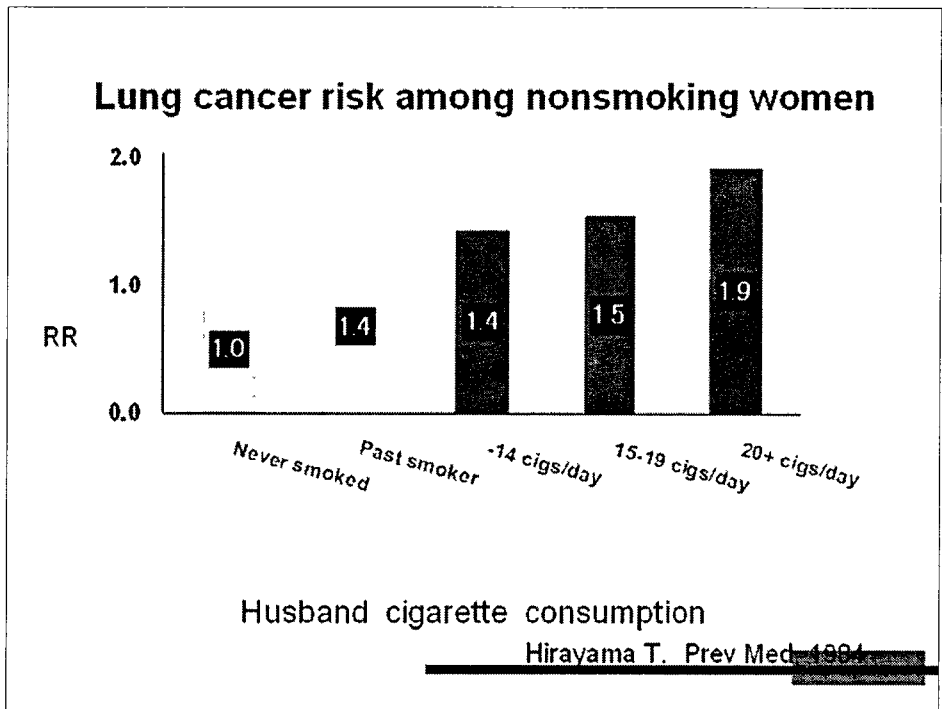
**Session II-1**

**Environmental tobacco smoke exposure  
as a determinant of health for indoor workers**

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**Born in Hiroshima,  
moved to Nagasaki.  
Now live in Fukuoka.**





### Examples of adverse health effects of environmental tobacco smoke

Lung: cancer, respiratory symptoms, asthma

Vascular: CHD (←HDL cholesterol)

Irritation: eyes, nose, throat, skin

Sick Building Syndrome

## Determinants of ETS exposure

### In Japan:

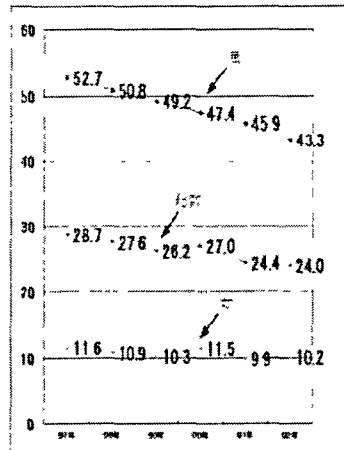
Smoking has long been a social norm.

Nearly 50% of adult men smoke.

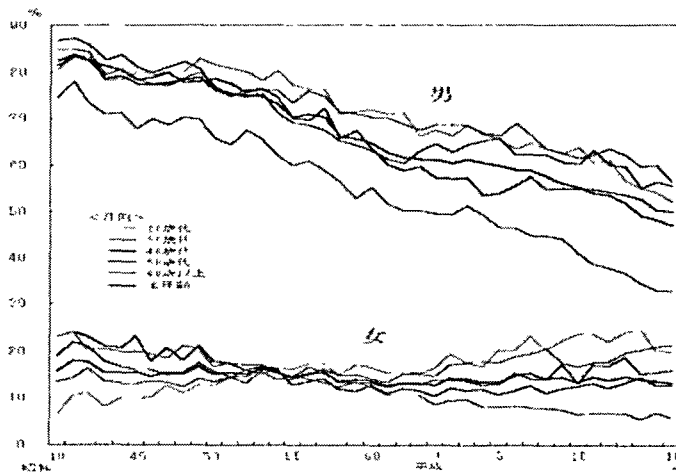
Workers spend long hours in un-partitioned offices.

Modern buildings are airtight (low ventilation rate).

Increasing number of women has entered workforce.



## Trend of smoking prevalence in Japan



### Measurements of ETS exposure

Place	Measurement	Feature (red: problem)
Home	Spousal smoking No. of smokers	· Through questionnaire or interview (inexpensive)
Workplace	Hours worked Restrictions	· Measure exposure in remote past · Partial exposure
Restaurant, bar	Frequency of visit	· Less reliable
All	Cotinine	· Highly reliable (expensive) · Overall exposure · Reflect current exposure (within 48 hrs)

## ( 1 )

### ETS exposure and HDL cholesterol, a preventive factor for CHD

#### Background & objective

Summary RR of CHD: 1.2 (*Wells AJ, 1994*)

Such a small increase in risk may be attributable to confounding effects.

Few mechanistic evidence in human exists to support the causal association between ETS exposure and CHD.

Is workplace ETS exposure associated with HDL-cholesterol levels ?

## Subjects and methods

27 municipal offices (>60 employees)

No or limited smoking restriction (as of 1995)

Periodic health examination

(lifestyles and biochemical analyses)

3,062 nonsmokers (2,135 women & 927 men)

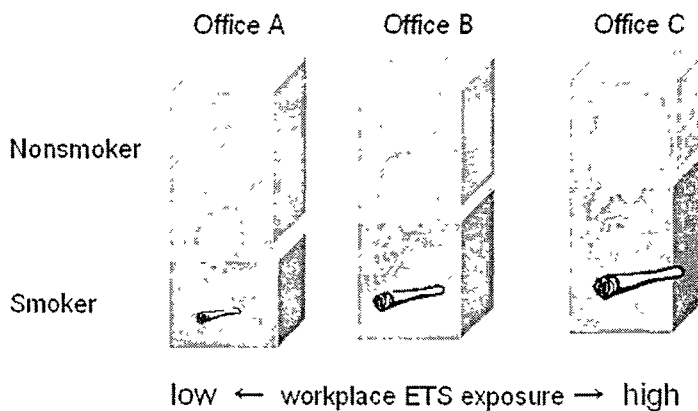
Index of ETS exposure at work

Office smoking prevalence

Office smoking intensity

## Assumption

ETS exposure among nonsmokers is greater in offices where smoking prevalence, or total cigarette consumption, is high.



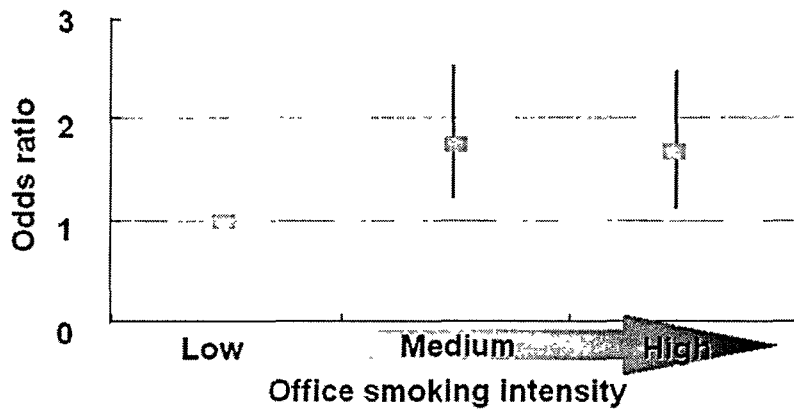
## ETS exposure index

$$\text{Office smoking prevalence} = \frac{\text{No. of smokers}}{\text{No. of all workers}}$$

$$\text{Office smoking intensity} = \frac{\text{No. of total cigarettes smoked by all smokers}}{\text{No. of all workers}}$$

*Mizoue et al. Am J Epidemiol. 1999*

**Odds ratio of having low HDL-cholesterol (<45 mg/dl) according to the office smoking intensity in women**



## Summary & conclusions

Upper two-thirds categories of office smoking intensity was associated with an increased odds ratio of having low HDL cholesterol levels in women, as compared with the lowest third.

Nonsmoking women who are exposed to higher levels of ETS in the workplace may have low HDL cholesterol levels, thus leading to an increased risk of cardiovascular diseases.

( 2 )

## ETS exposure and Sick Building Syndrome



Background & objective

- ▣ Modern offices is becoming tighter.
- ▣ ETS may be a major source of indoor air contaminants if smoking is not restricted.
- ▣ Is workplace ETS exposure associated with symptoms of typical of SBS ?

## Subjects and methods

1,281 employees of Kitakyushu city office

### Various smoking restrictions

Questionnaire survey (1/3 of workers) in 1998

ETS exposure at work

“ How many hours per day do you work in an indoor workplace where cigarette smoke is present ? ”

< 1 hours, 1-<4 hours, 4+ hours

## Indoor Air Questionnaire (MM040EA) Andersson, Sweden

Have you experienced following symptoms during the past 3 month period ?

If yes, do you think the symptom was related to work environment

	Yes, frequently (weekly)	Yes, sometimes	No, never	If yes, do you think the symptom was related to work environment	
				Yes	No
Fatigue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heavy headed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Headache	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nausea, dizziness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty concentrating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Itching, burning, or irritation of the eyes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irritated, stuffy, or runny nose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hoarse, dry throat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cough	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dry or flushed facial skin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scaling/itching of the scalp or ears	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dry, itching, or red-skinned hands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

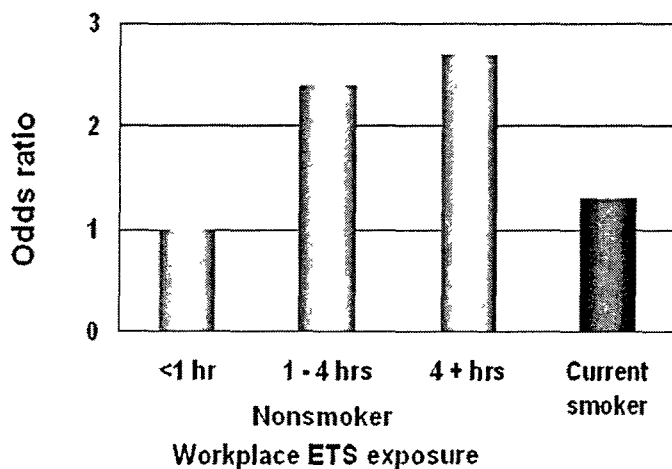


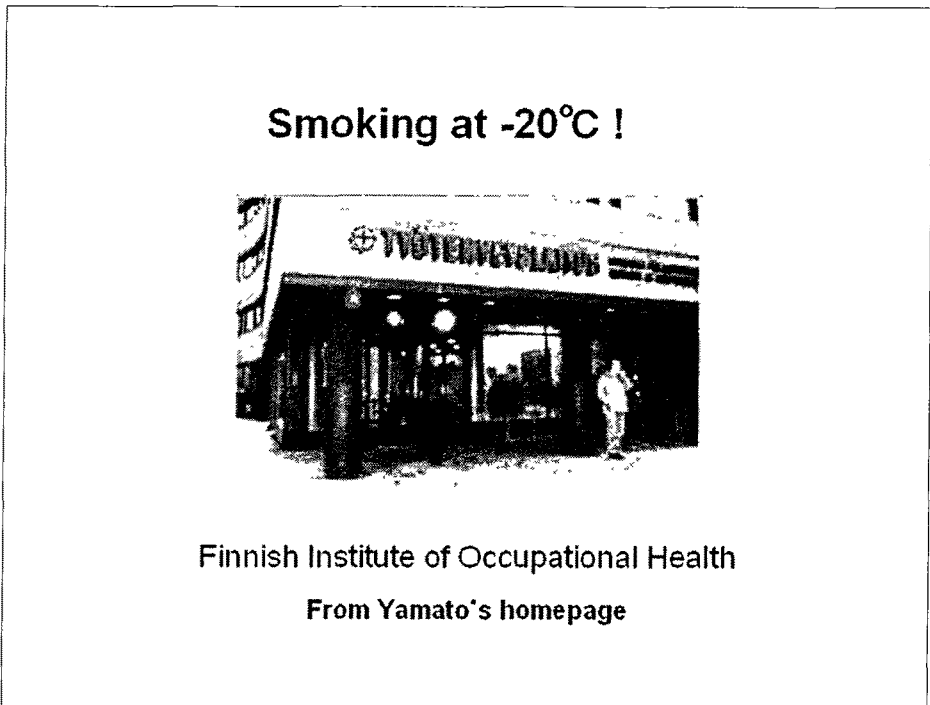
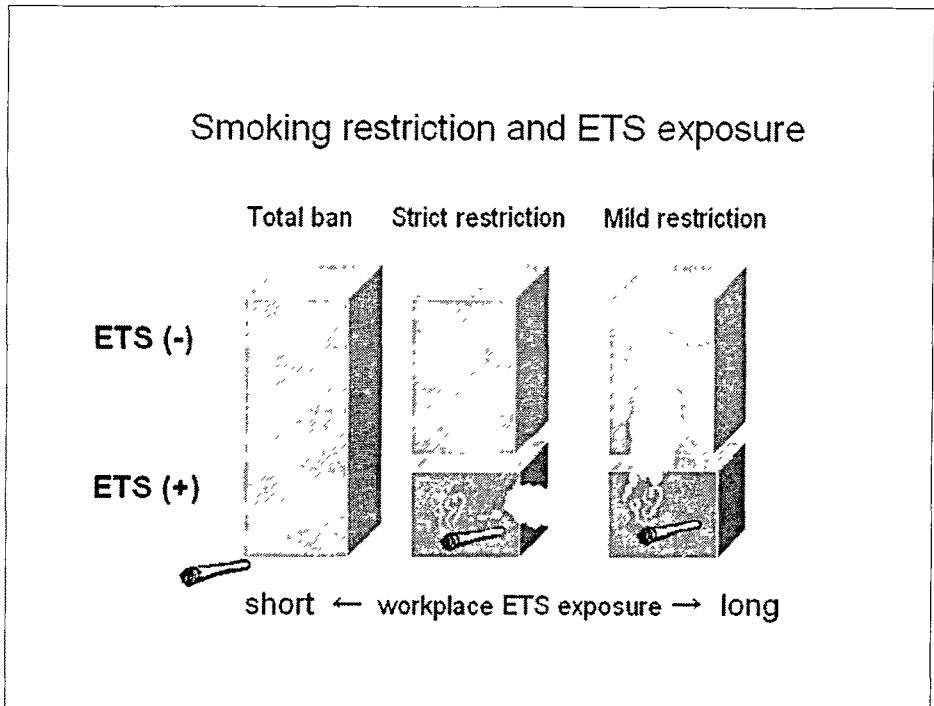
## Study-defined sick building syndrome

At least one general symptom (frequently)  
+  
at least mucous or skin symptom (frequently)

*Mizoue et al. Am J Epidemiol. 2001*

**Odds ratio of having sick building syndrome according to hours of workplace ETS exposure**

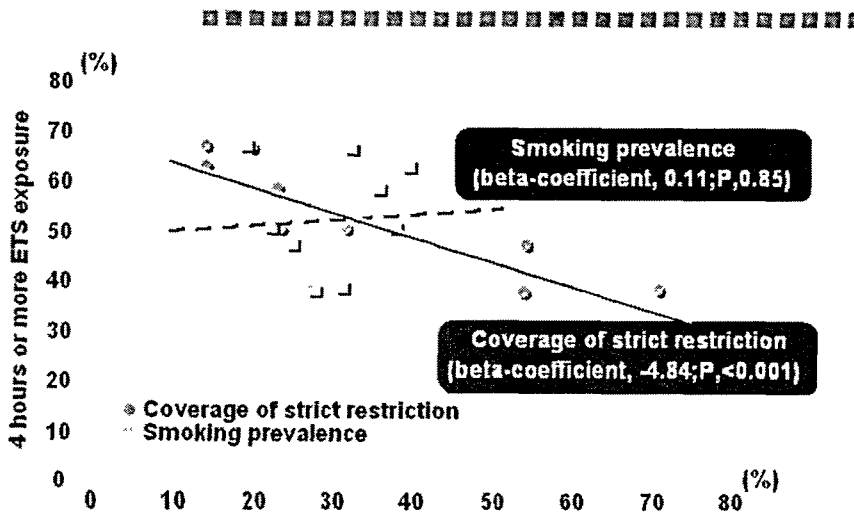




### Copying machine

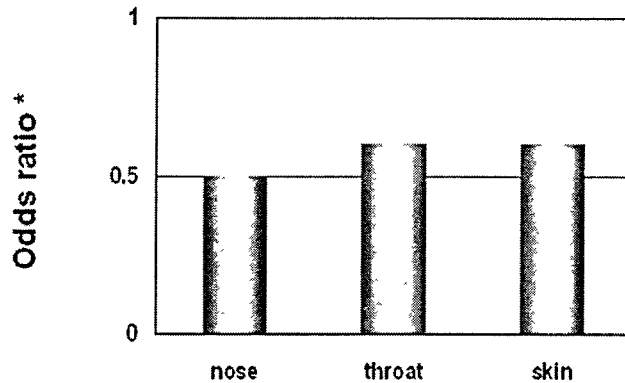


### Strict smoking restrictions can reduce ETS.



*Mizoue et al. Am J Epidemiol. 2001*

### The association of strict smoking restriction and symptoms of the nose, throat, and skin



\* Strict restriction (total ban or workroom ban) versus milder restrictions (work area ban, nonsmoking time)

## Summary & conclusions

- Four hours or longer of ETS exposure at work was associated with 2.7 times higher odds of having study-defined SBS.
- Workplace ETS exposure is an important contributing factor for symptoms typical of SBS in nonsmokers. Strict smoking restrictions can reduce ETS exposure, thus leading to a decreased SBS symptoms.

## Guidelines and regulations in Japan



1996 Guidelines on workplace smoking control (MOL)

2000 "Healthy Japan 21" (MOHW)

(2001 Establishment of Ministry of Health, Labour and Welfare)

2002 Assessment of smoking control measures

2003 **Health Promotion Law**

**New guidelines on workplace smoking control**

2004 Ratification of the WHO Framework Convention on Tobacco Control

## Health Promotion Law

Managers of school, gymnasium, hospital, theater, meeting place, exhibition hall, department, office, public facilities, restaurant, or other places where many people get together are required to take measures against passive smoking.

Appropriate measures:

1. Total ban
2. Designated smoking area  
Cigarette smoke not entering into nonsmoking area

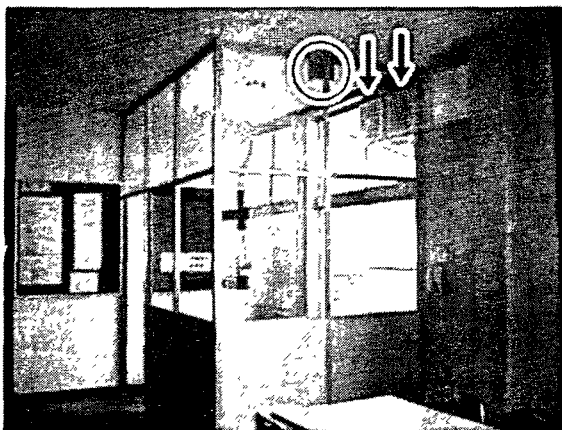
## **Guidelines on workplace smoking control**

- 1 Preface
- 2 Roles of the head, managers, and employees
- 3 Planning of a smoking control strategy
- 4 In-house organization (anti-smoking committee, etc)
- 5 Facilities (smoking room, partition, etc)
- 6 Measurements of indoor air (dust,  $\leq 0.15\text{mg/m}^3$ ; CO,  $\leq 10\text{ppm}$ ;  
air flow from nonsmoking to smoking space,  $0.2 + \text{m/s}$ )
- 7 Education
- 8 Evaluation
- 9 Others



**Air cleaner  
Is it effective?**

## Functional smoking room



From Yamato's homepage

### Advantages and disadvantages of smoking restrictions

	Accept (pre)	Accept (true)	Cost	Space	Effect
Total ban	—	(++)	—	—	++
Workroom ban	±	++	—~++	++	+~++
Work area ban	+	+	—~++	+	±~++
Time limit on smoking	++	—	—	—	—~±

**Thank you for your attention!**



**Yamakasa Festival. foto by Fukuoka city**