

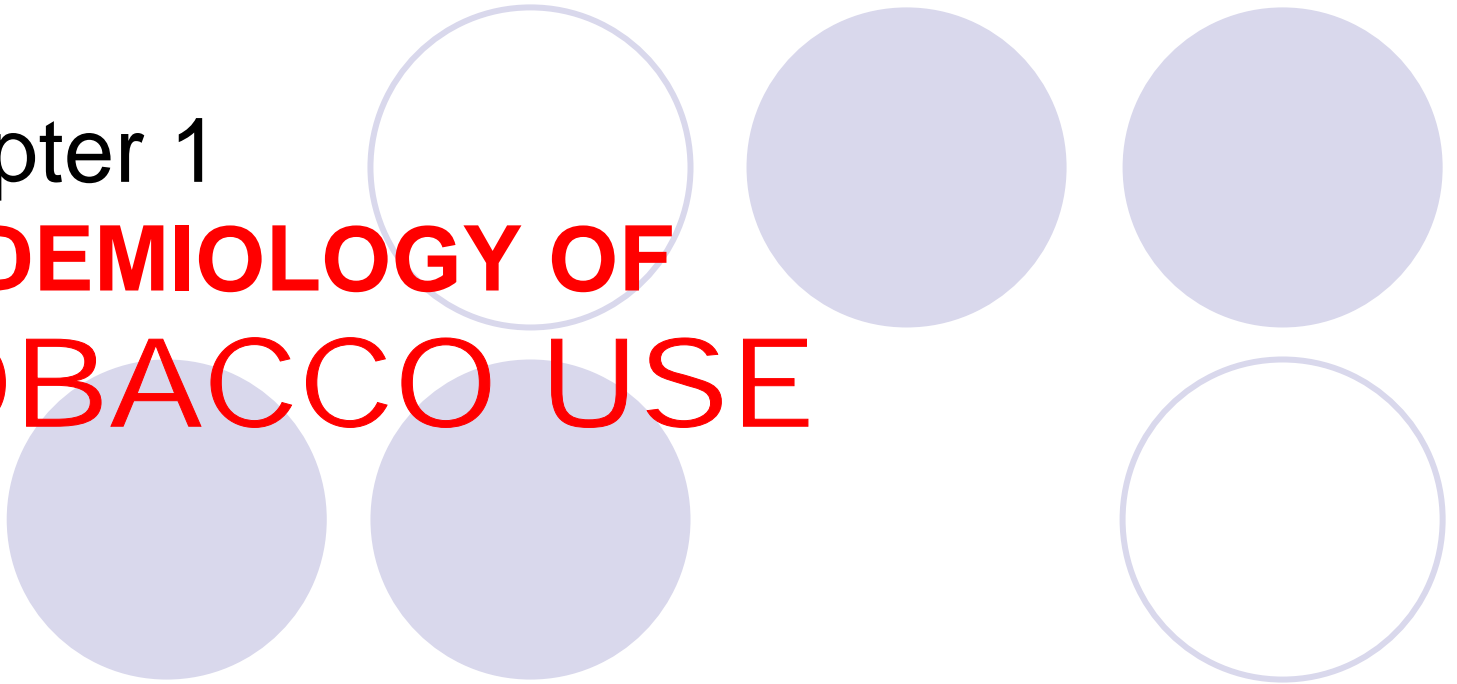
## MODULE 1

# EPIDEMIOLOGY OF TOBACCO USE AND THE HEALTH IMPACT OF SMOKING



Chapter 1

**EPIDEMIOLOGY OF  
TOBACCO USE**



Part 1

# Global Tobacco Situation





# Global Tobacco Situation

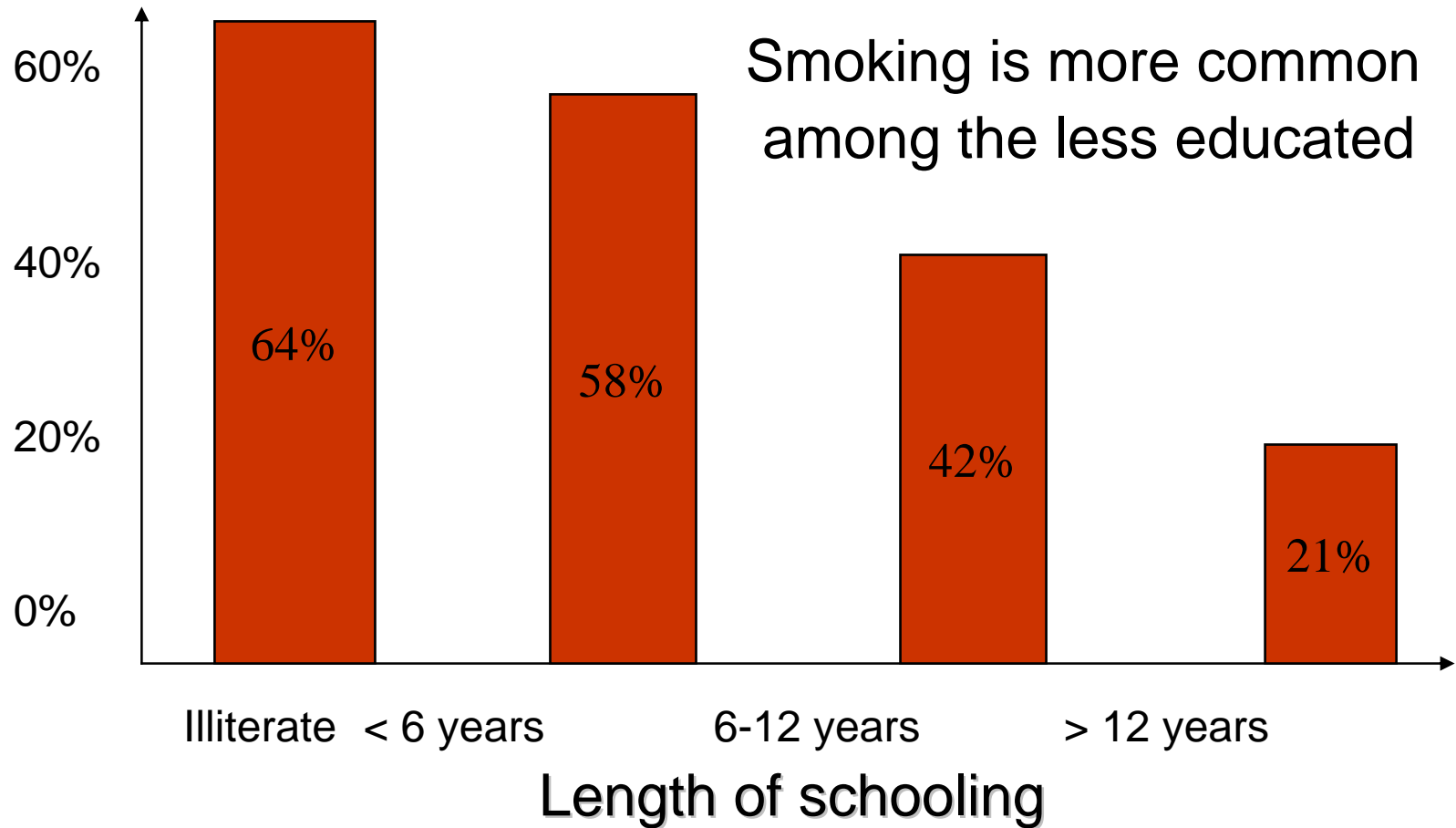
- World-wide, there are only two major underlying causes of premature mortality that are increasing substantially - **HIV/AIDS & tobacco**

- Bellagio Statement, 1995

# Global Smoking Prevalence 1998

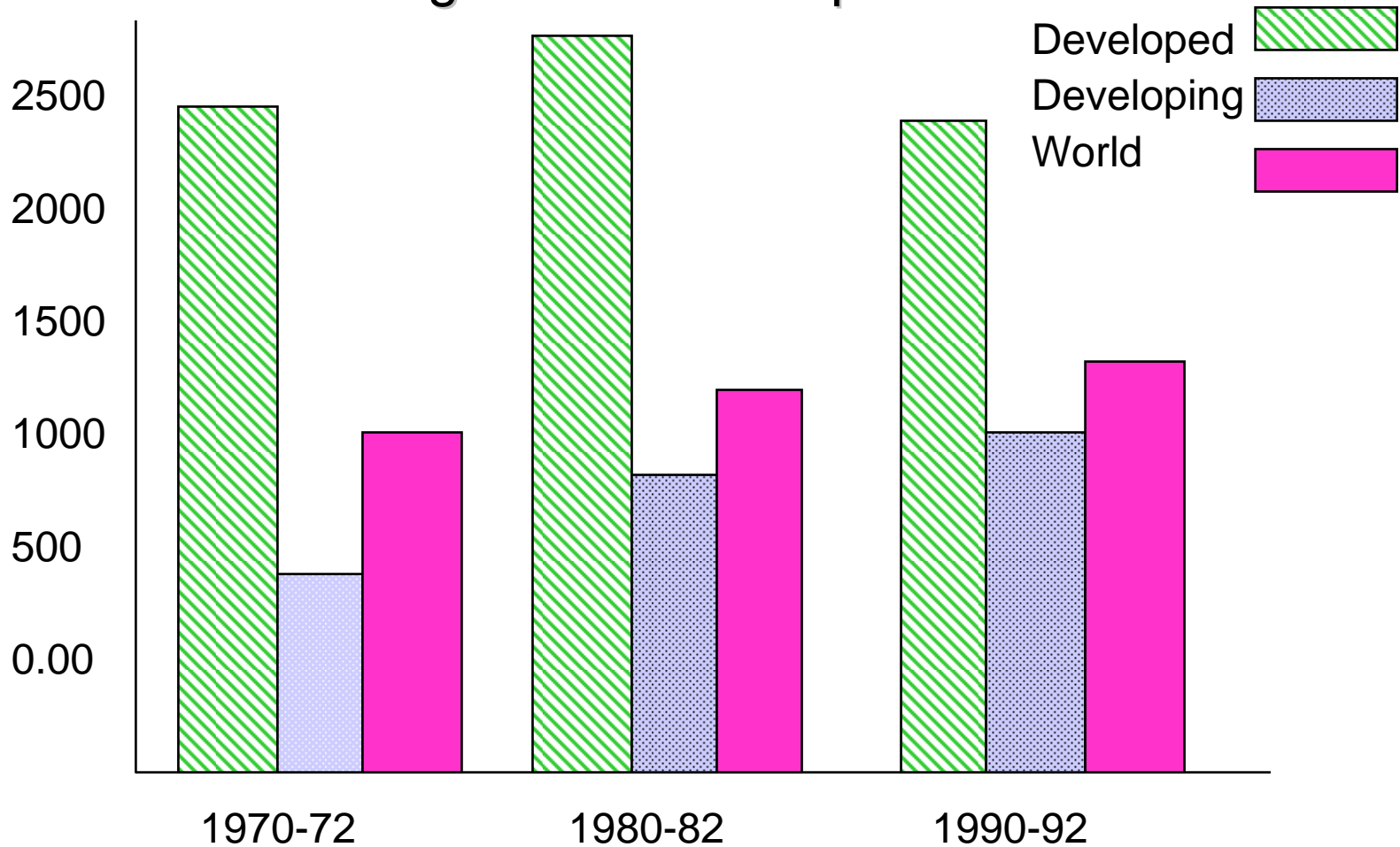
Country	No. of smokers (millions)	Smoking Prevalence Male(%)	Smoking Prevalence Female(%)
Developed	300	42	24
Developing	850	48	7
World	1,150	47	12

# Global Tobacco Situation



# Global Tobacco Situation

## Annual Cigarette Consumption



# Global Tobacco Situation

WHO Region	Cigs./ Capita (1995)	Mortality (000)	DALYs Est. 1998
Africa	480	125	1 900
Americas	1 530	772	8 867
East. Medit'n	890	182	2 976
Europe	2 080	1 273	17 084
SEA	415	580	7 439
West'n Pacific	1 945	1 093	11 022
World Total	1 325	4 025	49 288



# Global Tobacco Situation



- World average cigarette consumption per capita among those who smoke is estimated at ~15/ day
- This is equal to about 6 trillion cigarettes/ year, up from ~3 trillion in 1970



# Global Tobacco Situation

- Smoking prevalence is declining among men in high income countries but the tobacco industry is more that maintaining its profitability by targeting the low & middle income countries, where prevalence is increasing



# Global Tobacco Situation

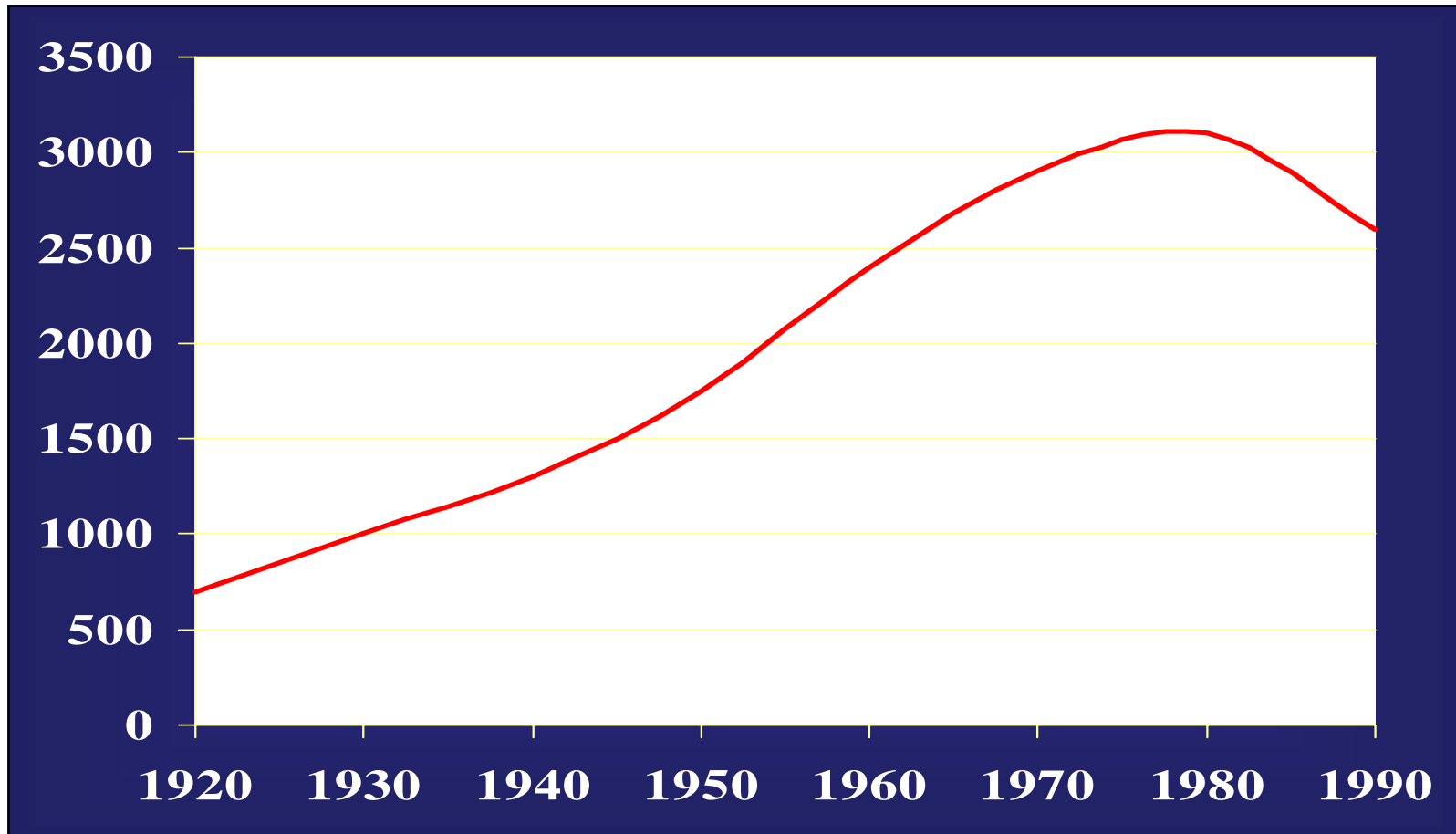
- Therefore, smoking epidemic has moved from original concentration on men in high-income countries to women in high-income countries & men in low-income countries. Smoking rates are also increasing among young people



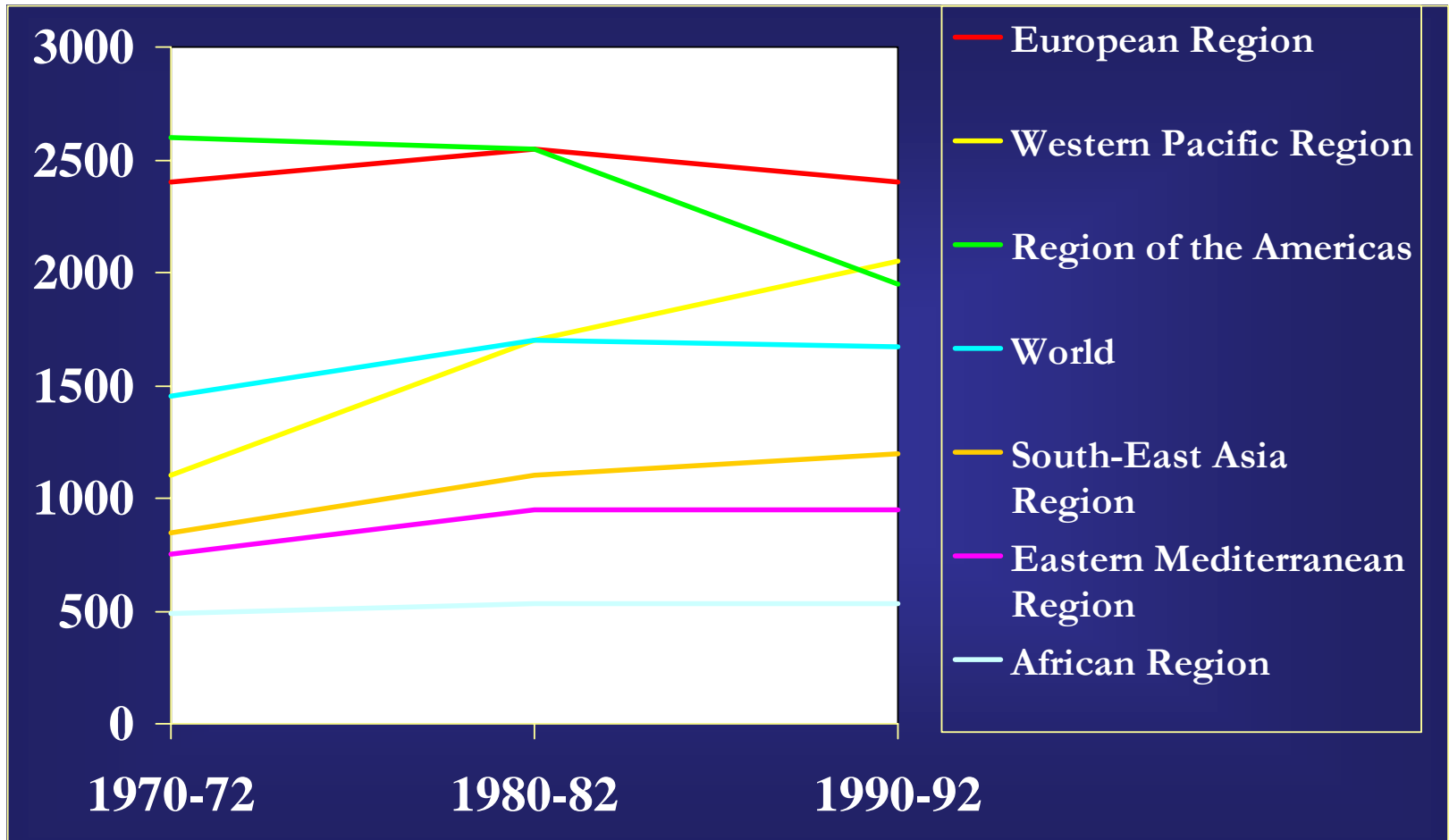
# Global Tobacco Situation

- Estimated that if status quo remains, more than 1.6 billion people will smoke by 2025
- Worldwide, an estimated 82,000-99,000 young people start smoking every day

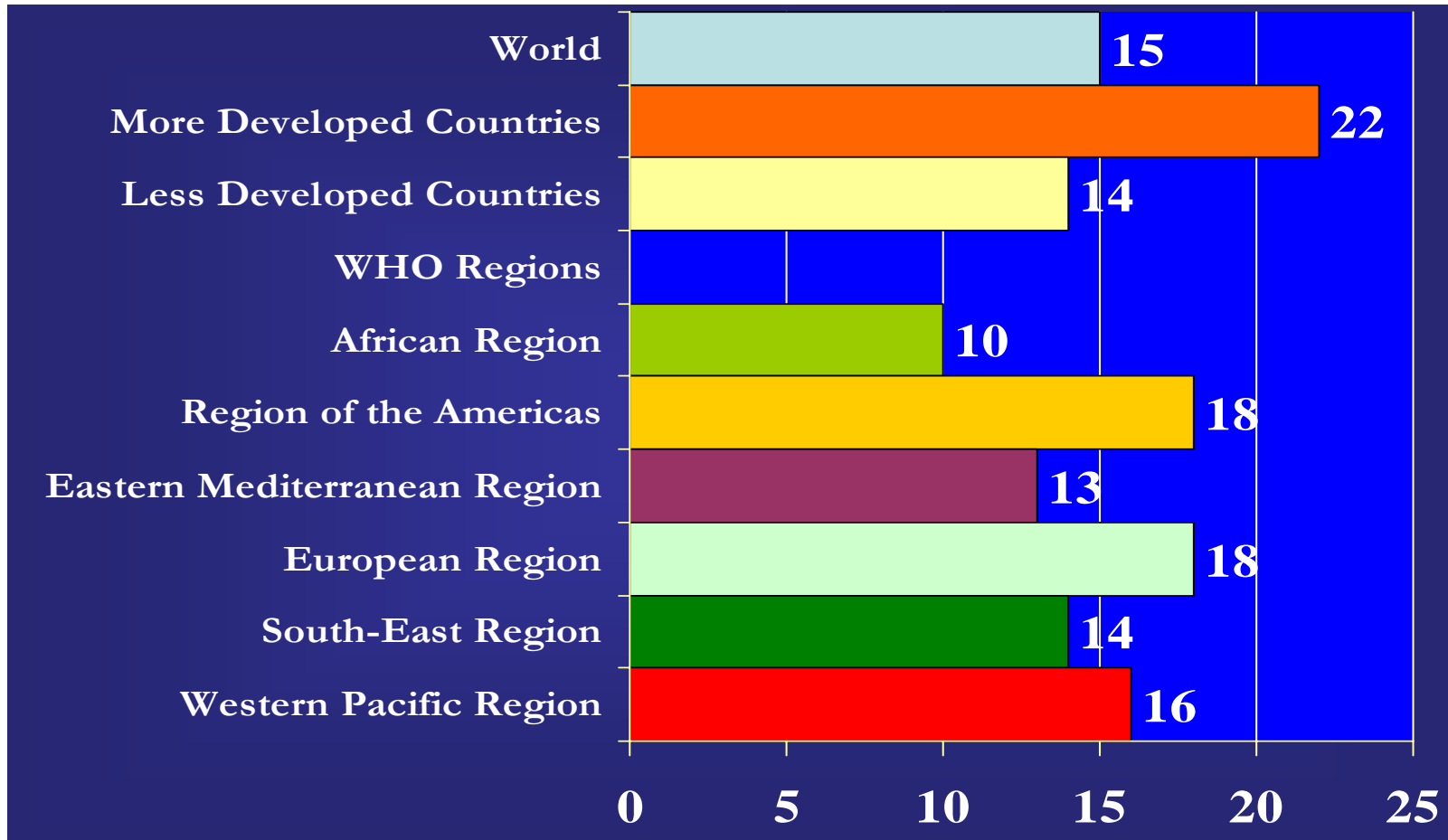
*Average Annual Cigarette Consumption  
per Adult in Industrialised Countries 1920-1990*



## *Trends in Annual per Adult Cigarette Consumption, WHO Regions 1970-1992*



# *Number of Cigarettes Smoked per Day per Daily Smoker, by Region*





# Global Tobacco Situation

- Tobacco currently kills approx. 4 million people each year, globally
- Tobacco is responsible for one in ten deaths, globally
- Expected to increase to one in six deaths or 10 million people per year, by 2030 - more than any other cause



Part 2 :

# National Tobacco Situation



# Smoking Statistics (NHMS)

	<u>1986</u>	<u>1996</u>
Overall	21.5%	24.8%
Male	40.9%	49.2%
Female	4.1%	3.5%
Urban	19.2%	21.7%
Rural	22.7%	28.6%
Malay	23.7%	27.9%
Chinese	17.7%	19.2%
Indian	15.2%	16.2%
Others	32.8%	32.4%

# Youth smoking statistics

- People age 18 years and <

- Prevalence

1996 - 16.9%

(male : 30.7%, female : 4.8%)

1999 - 18.2%

(males : 29%, females : 8%)

Daily, 45 - 50 youths start to take up smoking

# No. and percentage of current smokers in Malaysia 2000

Age group	Number (million)	%
Males (19 years & above)	3.26	78.4
Males (18 years & below)	0.52	11.2
Females (19 years & above)	0.34	7.3
Females (18 years & below)	0.14	3.1
Total	4.64	100

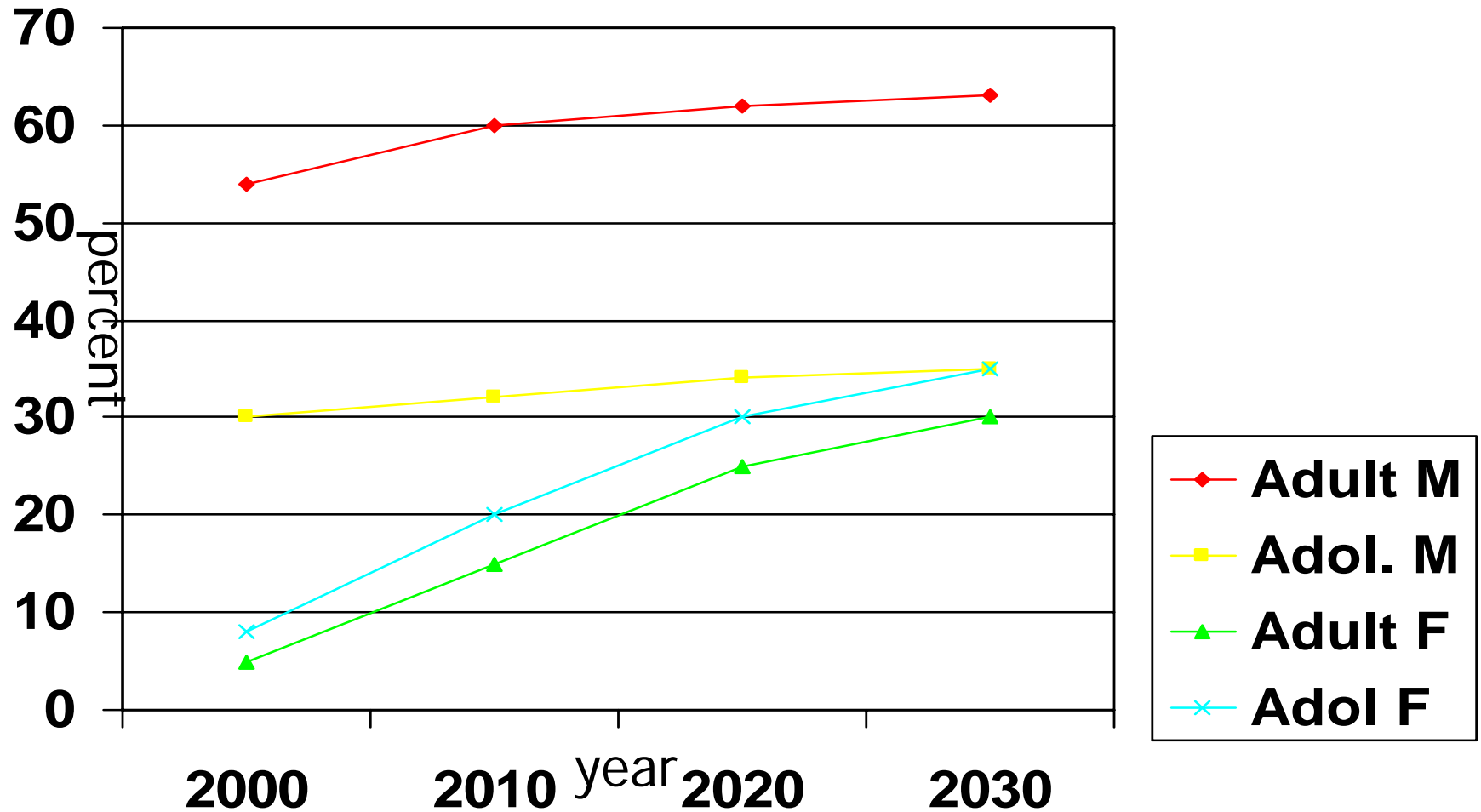
# Number of smokers – Estimates

2000

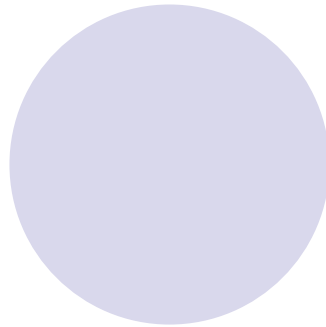
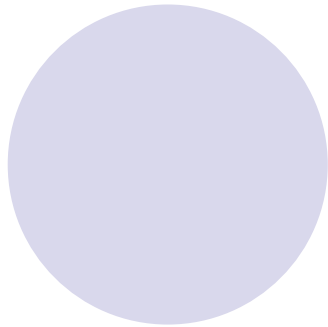
2025

Population	22 m	30 m
Population ( < 15 years)	7.5m (34%)	7.2m (24%)
Population ( > 15 years)	14.5m (66%)	22.8m (76%)
<u>Prev. adult smokers :</u>		
Male smokers	49%	60%
Female smokers	4%	30%
Overall adult prev.	25%	45%
Number of adult smokers	4.6 m	5.6 m

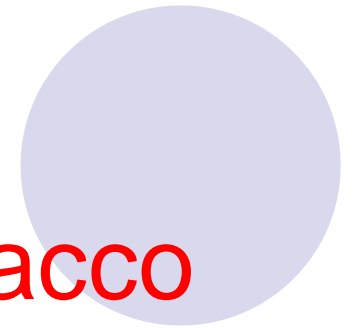
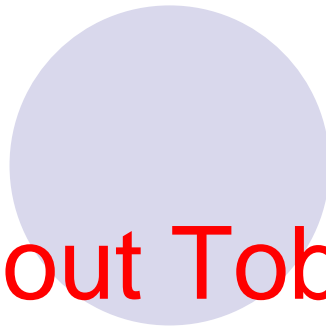
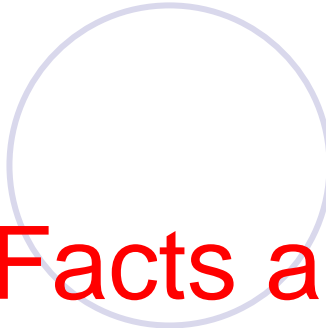
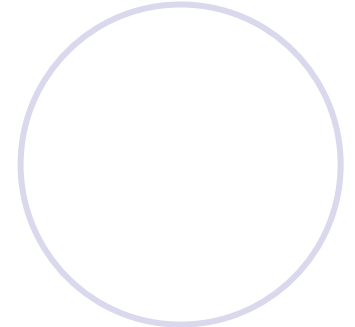
# Forecasted trend of smoking prevalence in Malaysia up to 2030



# Chapter 2 : Facts about Tobacco



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Tobacco, whether smoked, chewed or sniffed, contains nicotine, which is highly addictive, and contains over **4000 chemicals of which 43 are known carcinogens**



# Chapter 2

## Nicotine and nicotine dependence

### Part 1. Nicotine and nicotine dependence

# Nicotina sp.

- 67 species,
- is native mainly to the western hemisphere.
- named after the 16th-century French diplomat Jean Nicot, who introduced it into France.
- sticky, hairy, bitter foliage and are poisonous.
- *Sik'ar* (Maya) , *Ciggaro* (Spiniards)

# Effect of Nicotine

## ACTION

- Release of dopamine
- Release of epinephrine from adrenal cortex
- Binds with acetylcholine in brain



## EFFECT

- Pleasure sensation
- causes fatigue & restlessness following excessive release of glucose
- Effect on 'mood', alertness

# Nicotine addiction can begin in days !



WORCESTER, Massachusetts (CNN) -- Dependency on nicotine can start even before smoking becomes a daily habit, according to new research.

# Smoking Fits Addiction Criteria !

## Addiction - criteria :

- Increase dopamine receptor
- Psychological and physical dependence
- Withdrawal
- Compulsive drug use

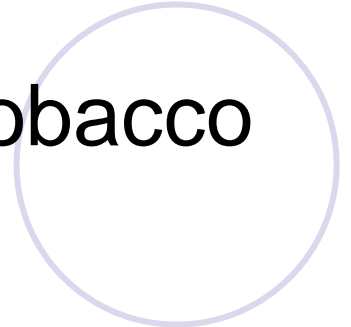
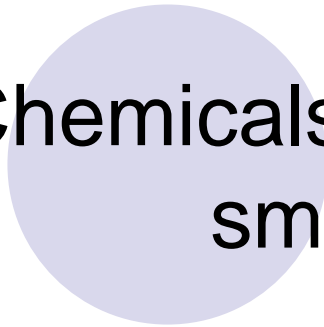
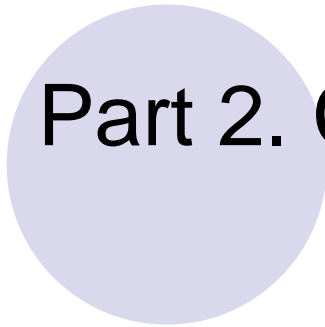
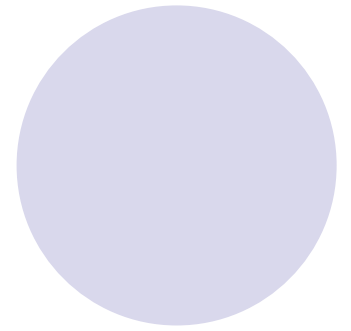
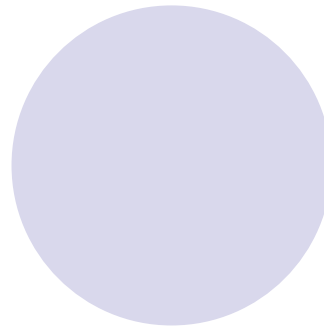
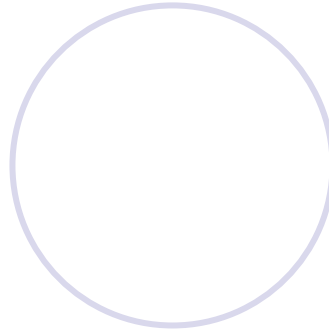


Cont.

- A highly controlled or compulsive pattern of drug use
- Psychoactive or mood altering effects, involved in the pattern of drug taking :
  - mood -altering , anxiety reducing and stimulating effects.
- Drug functioning as **a reinforcer** to strengthen behaviour and lead to further drug ingestion.

# Chapter 2.

## Part 2. Chemicals found in tobacco smoke



# Chemicals in Cigarette and Smoke

- **Carcinogens**

- Hydrocarbon eg. Naphtalene,benzyl groups
- Aldehyde eg. Formaline
- Heavy Metal eg. Cadmium, nickel
- Radioactives eg. Polonium





# Chemicals in Tobacco Smoke

## **Poisonous Gas**

○ CO, Hydrogen disulphide, hydrogen cyanide

## **Complex compound**

○ eg. Tar



# Chemicals in Tobacco Smoke

- **Additives**

- Amount to 200-300 types of chemicals
- Make cigarettes milder, easier to inhale, improve taste, prolong burning and shelf life
- eg. Ammonia (facilitates absorption of nicotine)

**Chapter 3.**

**Health impact of smoking**

# Chapter 3.

## Part 1. Mortality due to Smoking



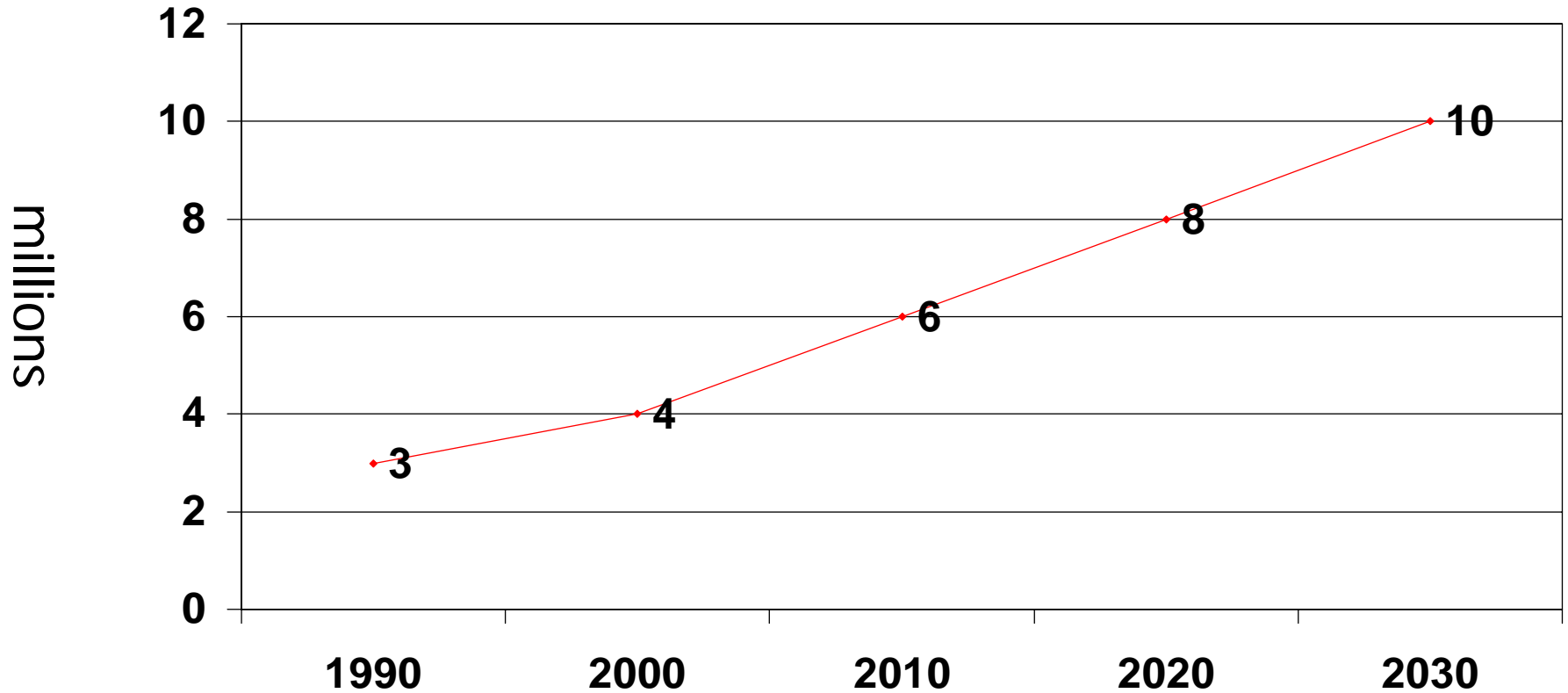
# Death due to tobacco



According to WHO Fact Sheet:

- **4.9 million death in 2002**
  - 13 400 death a day
  - 560 death per hour
  - 1 death every 6.4 seconds
- **By 2030 → 10 million death**
  - 27 400 death a day
  - 2280 death per hour
  - 1 death every 3 seconds

# Forecasted mortality trend due to tobacco use 1990-2030



# Death due to smoking



- 50% of smokers will die of diseases related to smoking.
- 25% of all death due to heart disease
- 30% of all death due to cancer
- 25% of all death due to stroke
- 90% of all death due to lung cancer
- 85% of all death due to COPD

# Mortality risk among smoker

1. RESPIRATORY AIRWAY DISEASES	10 - 20 X
2. LUNG CANCER	5 - 30 X
3. THROAT CANCER	5 - 30 X
4. ORAL CANCER	3 - 15 X
5. ESOPHAGUS CANCER	4 - 5 X
6. CANCER OF PANCREAS	2 X
7. URINARY BLADDERCANCER	2 - 3 X
8. HEART DISEASE	2 - 3 X
9. KIDNEY CANCERS	1.5 X



# Mortality Due To Smoking in Malaysia



- Smoking cause an annual death of 10,000 people
- About 10-20% of all deaths in Malaysia are due to smoking
- Most of the deaths are due to heart disease, cancer and stroke

**Chapter 3.**

**Part 2. Morbidity due to  
Smoking**



# Diseases related to smoking

- 40 diseases –
- All organs can be effected.
- Smoking can cause permanent tissue damage.

# Diseases related to smoking

- Smoking cause around 100,000 hospital admission to government hospital annually in Malaysia, mainly due to
  - Heart disease
  - Respiratory problem
  - GIT problem

Chapter 3.



Part 3. Passive Smoking



# What is passive smoking?

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- Involuntary exposure of nonsmokers to second hand smoke
  - also known as involuntary smoking
- – second hand smoke is a mixture of sidestream smoke and exhaled mainstream smoke in the air



# Second Hand Smoke

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## Sidestream Smoke (SS)

- smoke originating from the smoldering cigarette
- principal contributor to second hand smoke
- Contain higher concentration of compounds compared to MS

## Exhaled Mainstream Smoke (MS)

- smoke exhaled by the smoker

# Does second hand smoke exposure pose a risk to health?

Yes.

- Similar irritants, toxicants and carcinogens found in SS and MS
- No evidence of a threshold dose for health effects of active smoking, e.g. lung cancer
- Biomarkers of tobacco smoke, such as cotinine, show that second hand smoke is taken up by nonsmokers
- Epidemiologic studies provide evidence that second hand smoke causes diseases in children and adults
- Studies also indicate that passive smokers has 30% higher risk of developing cancer and 25% higher risk to get cardiovascular disease compared non-exposed.



# Health effects of second hand smoke exposure in children

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- Sudden Infant Death Syndrome (SIDS)
- Acute respiratory illnesses
- Chronic respiratory symptoms
- Reduced lung function growth
- Asthma and exacerbation of asthma symptoms
- Acute and chronic middle ear disease

# Children can be exposed to tobacco smoke before and after birth

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- Children are exposed to tobacco smoke if:
  - mother is active smoker during pregnancy
  - mother is passive smoker during pregnancy
  - child lives with smoker(s) and is exposed to second hand smoke

# Health effects of second hand smoke exposure in adults

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## Established

- Lung cancer
- Respiratory symptoms
- Cardiovascular disease
- Exacerbation of asthma

## Potential

- Reduced lung function
- Other cancers



# Illustration of health effects due to smoking

Chapter 3.

Part 4.

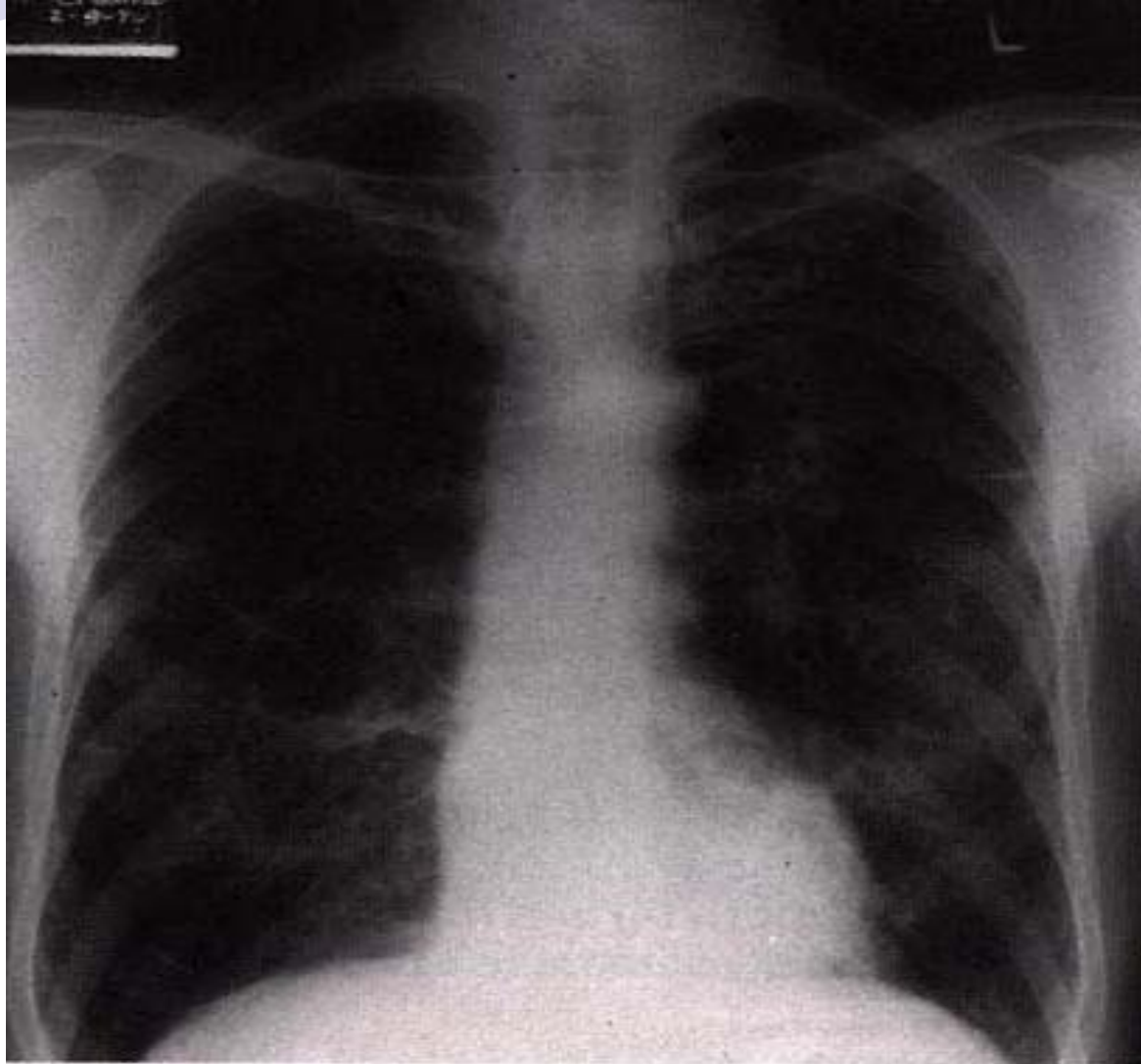
Illustration of health  
effects due to smoking

# Images of Chronic Obstructive Airways Disease

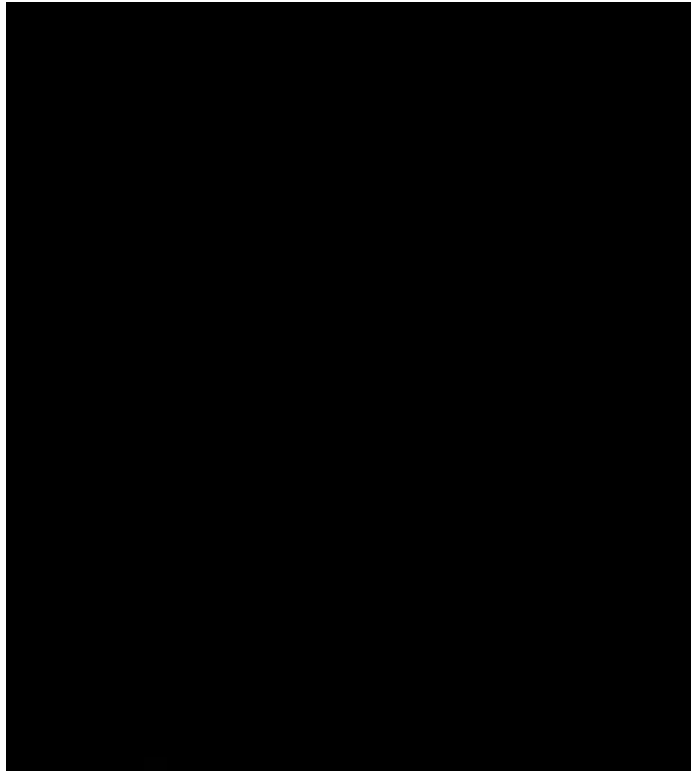


Emphysema

# Chest Xray : COAD



Every cigarette is doing you  
damage.....



EFFECT OF TAR  
ON RESPIRATORY



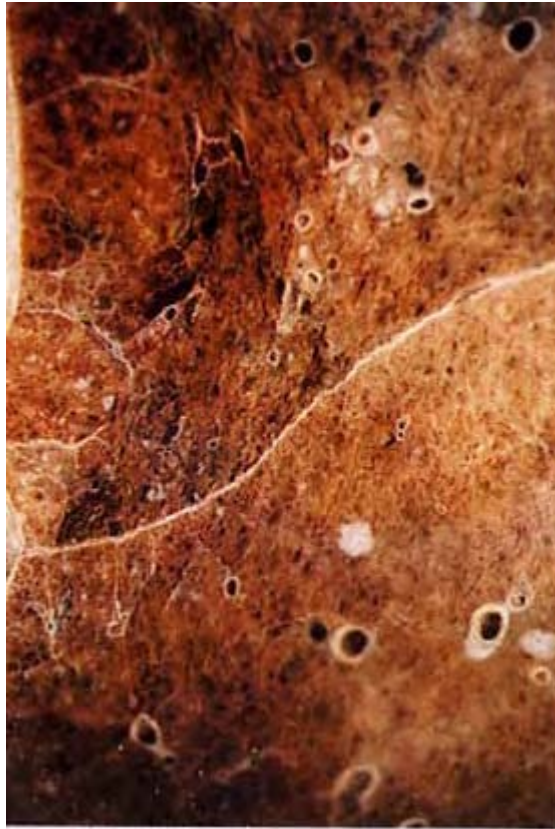
EFFECT OF TAR  
ON RESPIRATORY



# Smoker's lung specimen



**Emphysema**



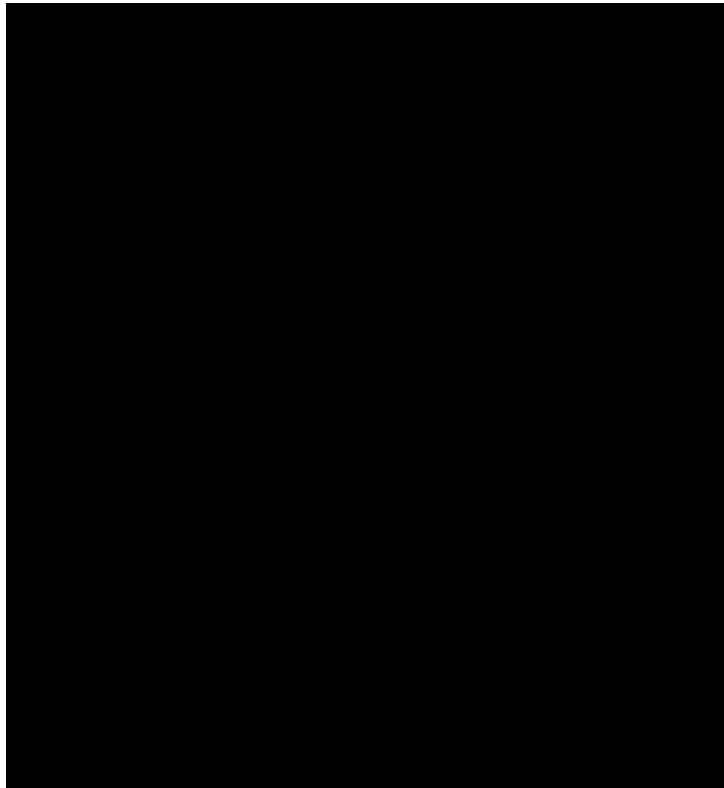
**Normal Lung**

**Bronchiectasis**

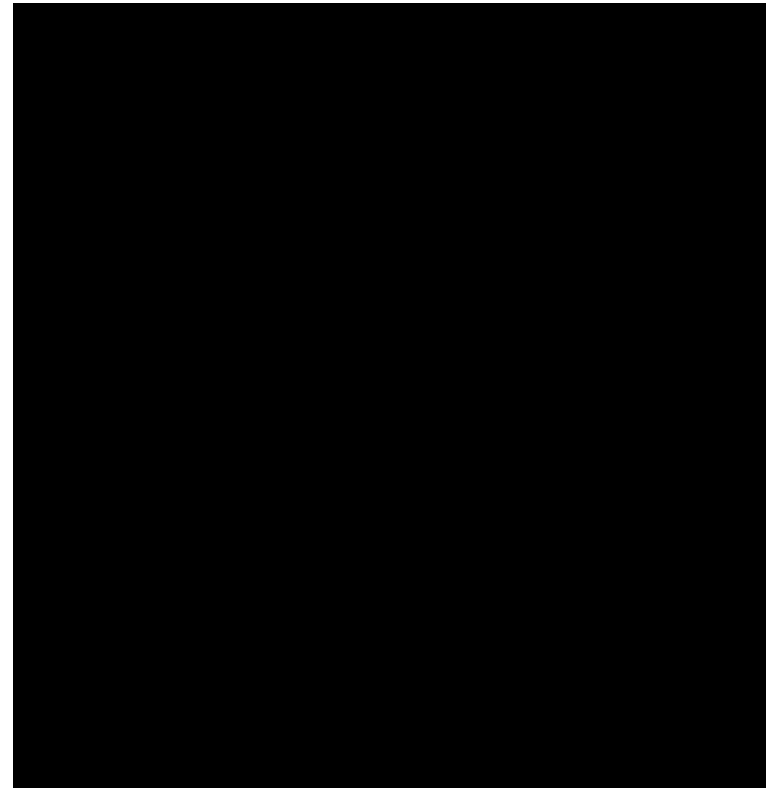




Every cigarette is doing you  
damage.....

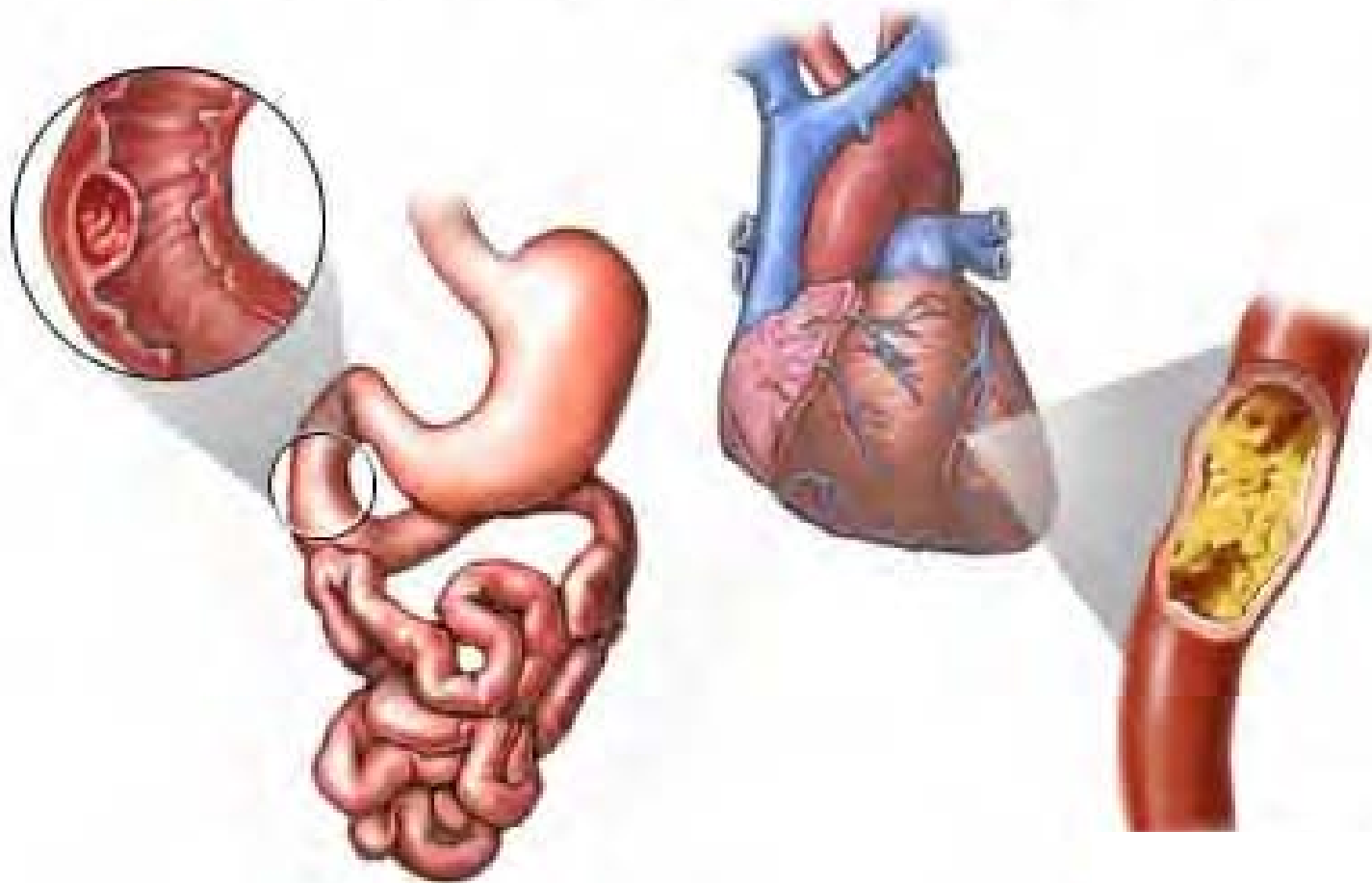


EFFECT OF  
OBSTRUCTION ON  
CORONARY VESSEL



EFFECT OF  
OBSTRUCTION ON  
CEREBRAL VESSEL

Tobacco use is associated with increased risk of peptic ulcers and coronary artery disease



# Mouth cancer



Tobacco use is associated with increased risk of cancers of the lung, mouth and esophagus



# SVC Obstruction

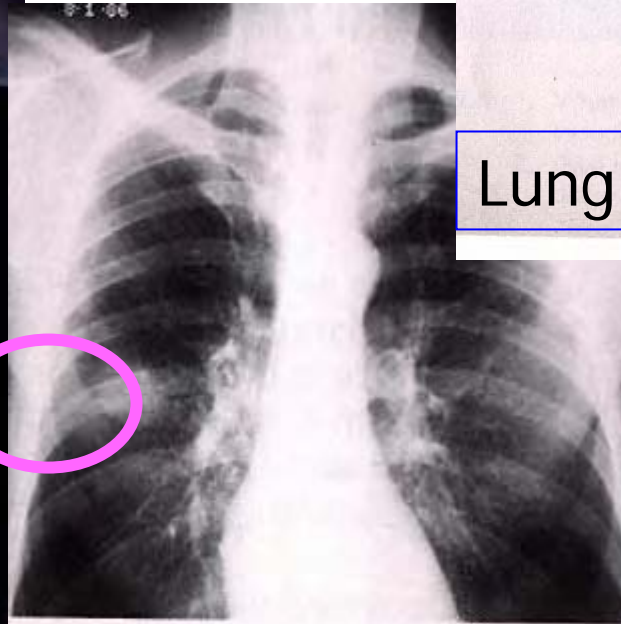
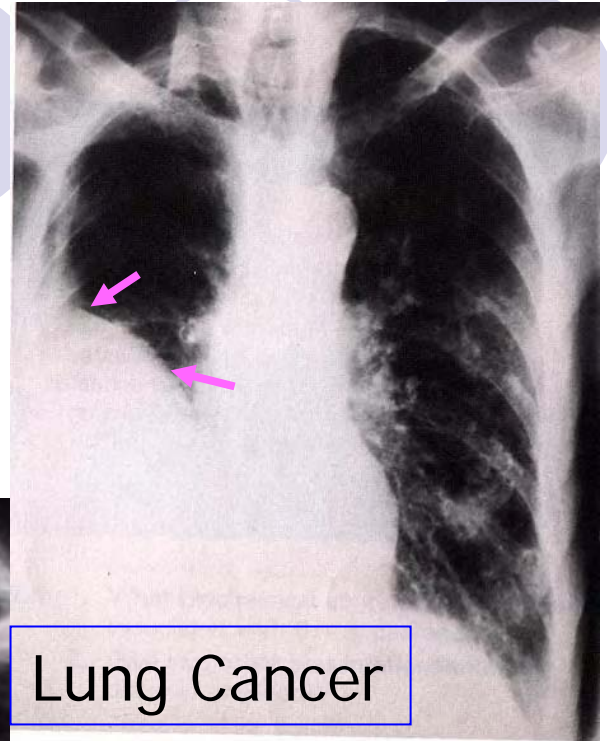


Fig. 132 Primary bronchial carcinoma: incidental finding in a 45-year-old smoker.

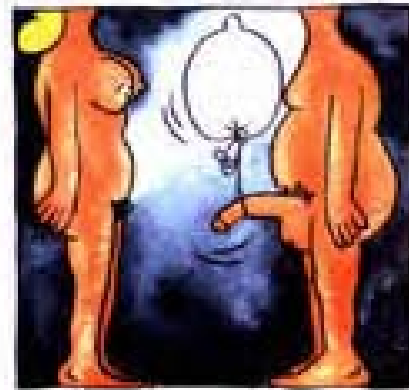
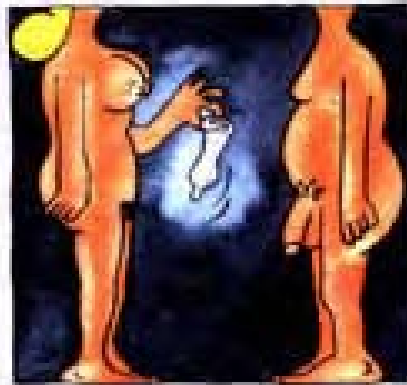
# Peripheral Vascular Disease



## Buerger's Disease



# May Cause Erectile dysfunction





**Women who smoke has a 3 times probability of getting spontaneous abortion and fetal anomalies**



abortion

Deformed fetus







Premature  
delivery



Low birth  
weight

## Women may 'suffer more from smoking'

November 15, 2000

Web posted at: 6:13 AM EST (1113 GMT)

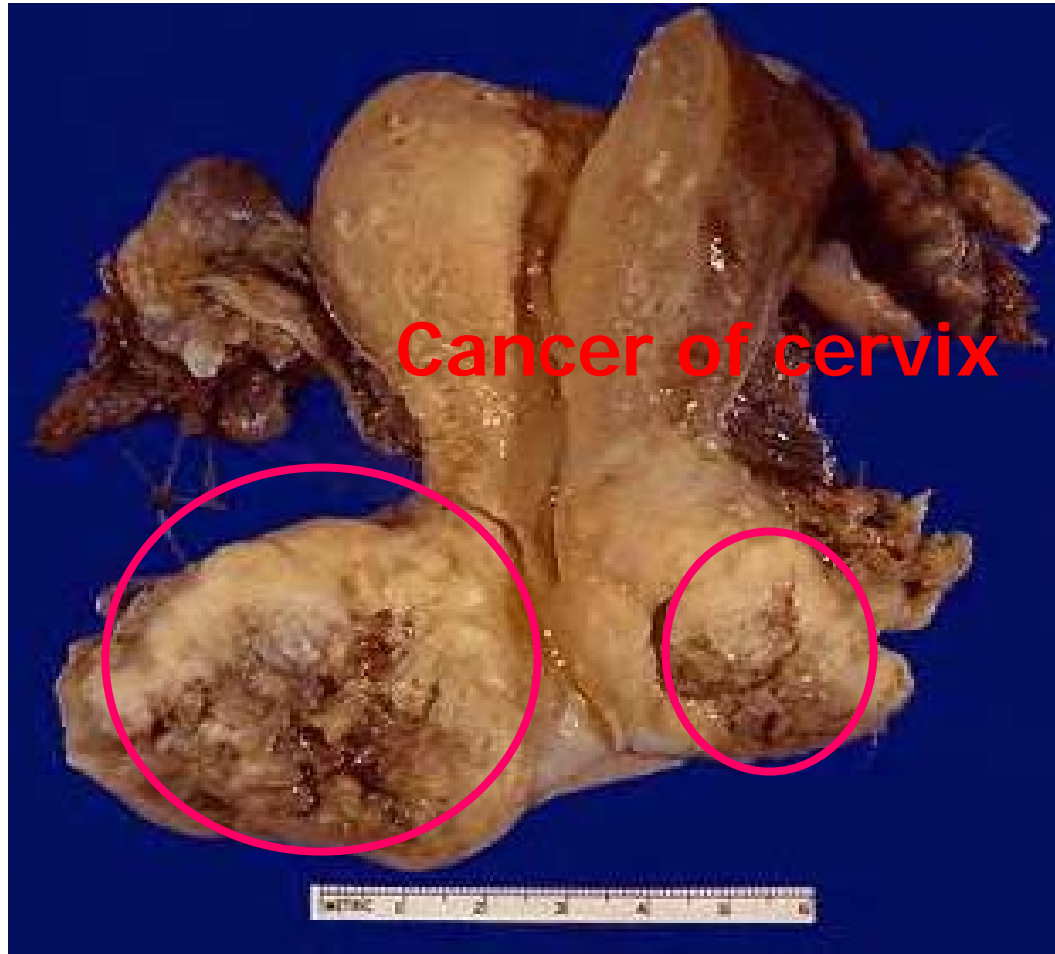
### **LONDON, England --**

Women suffer more from smoking than men because of their generally smaller lungs, scientists say.

Women are more vulnerable than men to the breathing problems and other harmful effects of smoking, Norwegian doctors found during two years of study.



No.2 killer in women



# New clue to why smokers look older

March 22 —

**There's a new wrinkle in the old question of why smokers' faces are prematurely lined. A report in The Lancet medical journal this week suggests smoking switches on a gene involved in destroying collagen, the structural protein that gives skin its elasticity.**

ASSOCIATED PRESS

# Chapter 5

## Benefit of Quitting Smoking



# WHEN SMOKERS QUIT.....



Within 20 minutes of smoking that last cigarette, the body begins a series of changes

- **AT 20 MINUTES AFTER QUITTING**

- Blood pressure decreases

- Pulse rate drops

- Body temperature of hands and feet increases

- **AT 8 HOURS**

- CO level in blood drops to normal

- O2 level in blood increases to normal

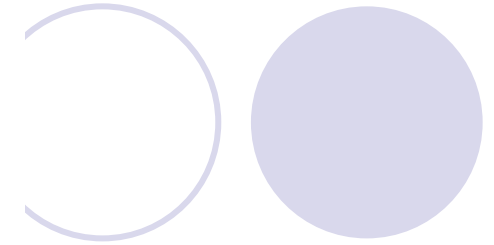
- **AT 24 HOURS**

- Chance of a heart attack decreases

- **AT 48 HOURS**

- Ability to smell and taste is enhanced, nerve endings start growing

**WHEN SMOKERS QUIT.....**  
THE FIRST YEAR AFTER QUITTING



- **AT 2 WEEKS TO 3 MONTHS**

  - Circulation improves

  - Walking becomes easier

  - Lung function increases

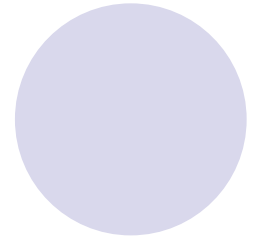
- **1 TO 9 MONTHS**

  - Coughing, sinus congestion, fatigue, shortness of breath decreases

- **1 YEAR**

  - Excess risk of coronary heart disease is decreased to half that of a smoker

# So if smoker quit now, will he lives longer ?



- Male smokers who quit.....  
ADD an average of 5 years to their lives.
- Female smokers who quit.....  
ADD an average of 3 years to their lives.
- After 15 years off cigarettes, risk of death returns to nearly the level of people who have never smoked.