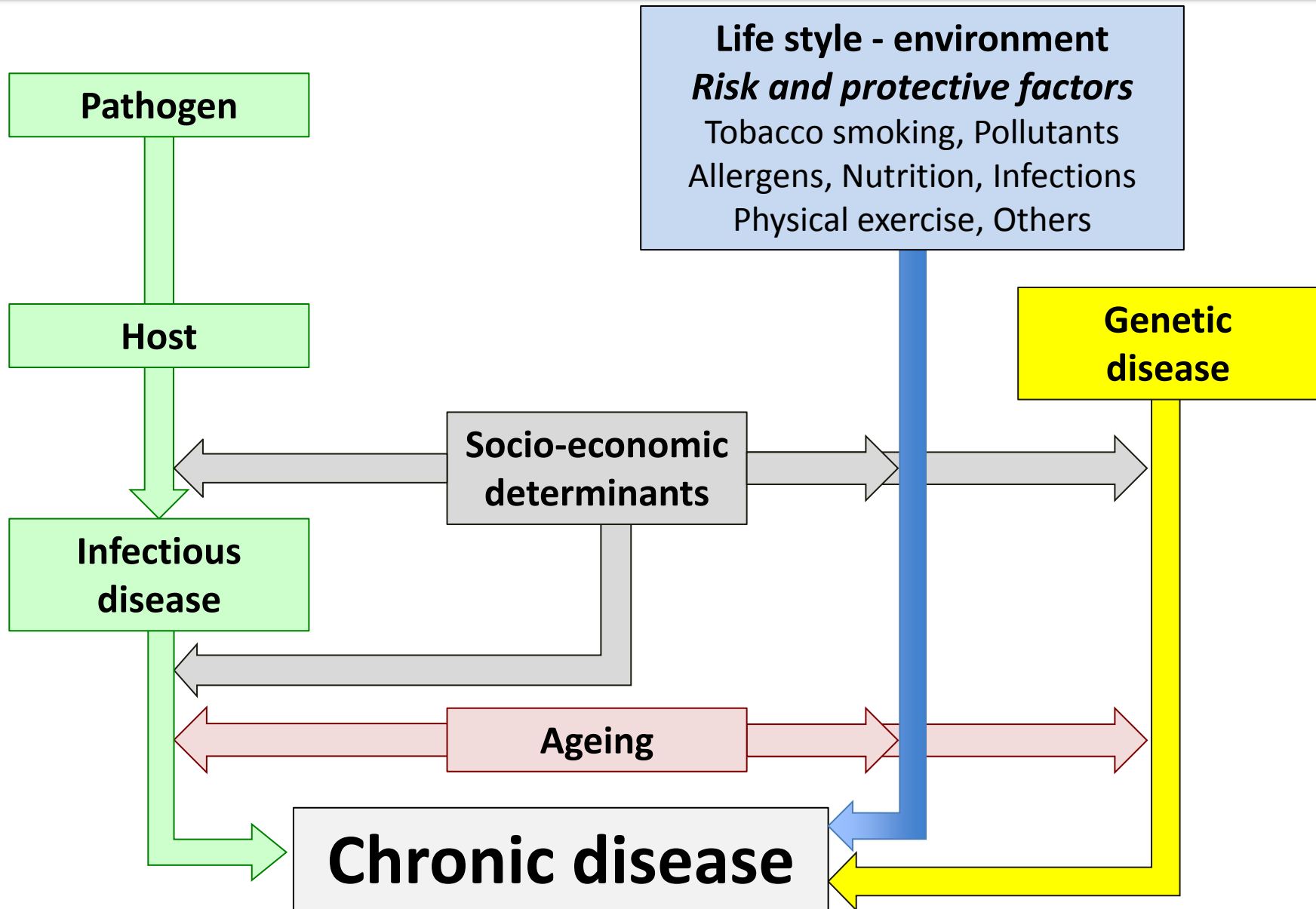


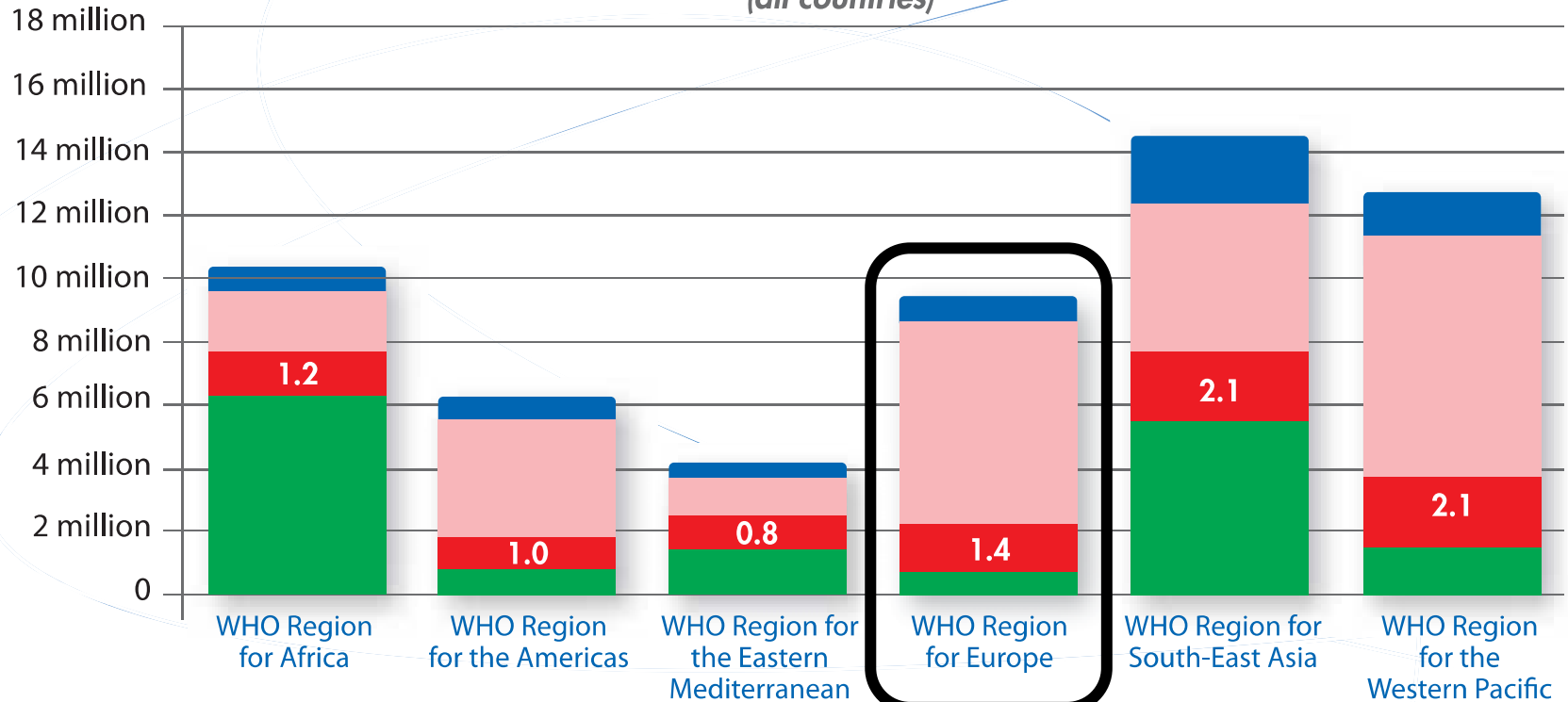
# **Systems Approach in Multifactorial Chronic Diseases with Co-Morbidities**

**1- Chronic diseases: the global health priority**

# Chronic diseases



## Total deaths in each WHO Region (all countries)



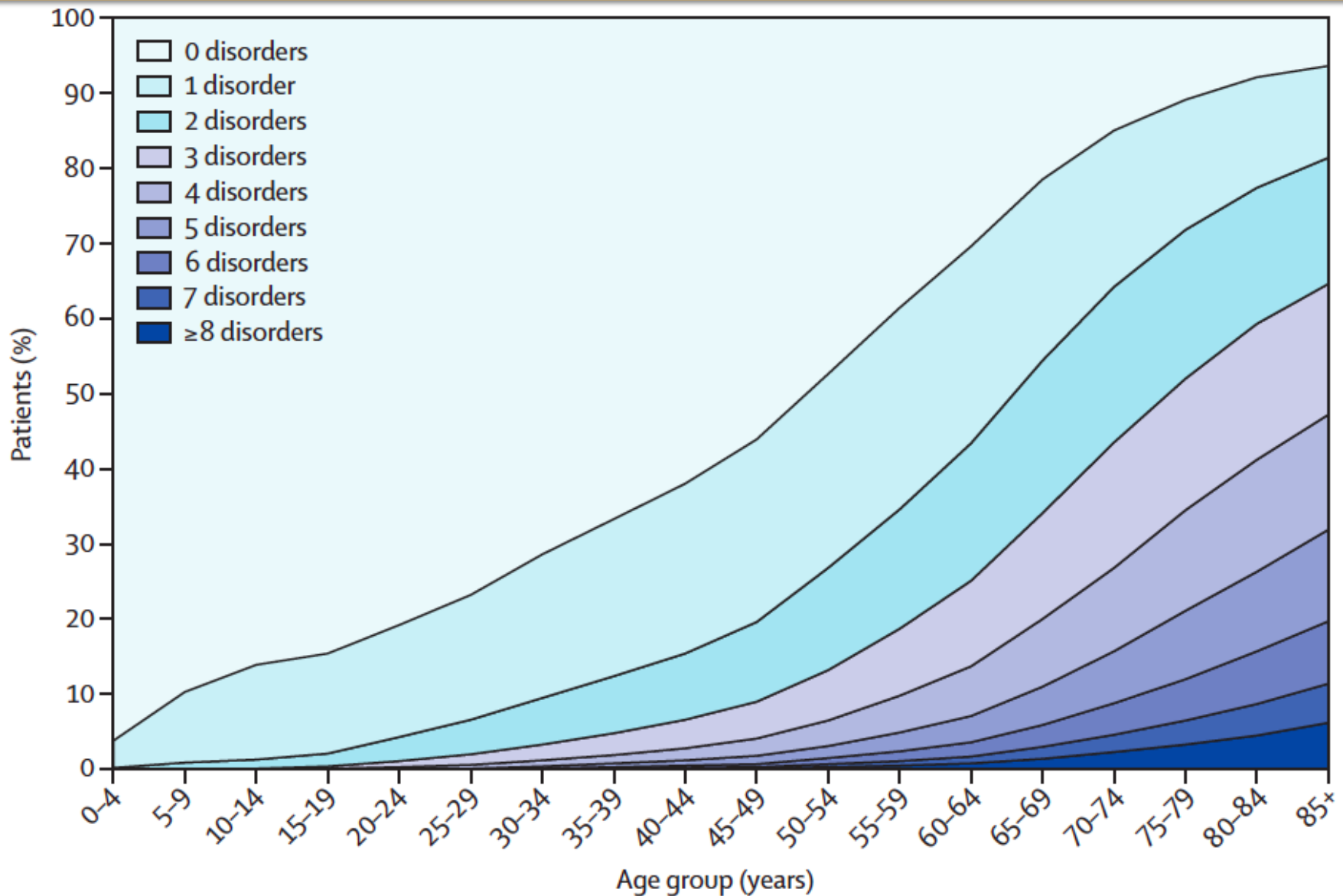
Source: WHO estimates 2008

- Group III - Injuries
- Group II - Other deaths from NCDs
- Group II - Premature deaths from NCDs (below 60 years), which are preventable
- Group I - Communicable diseases, maternal, perinatal and nutritional conditions

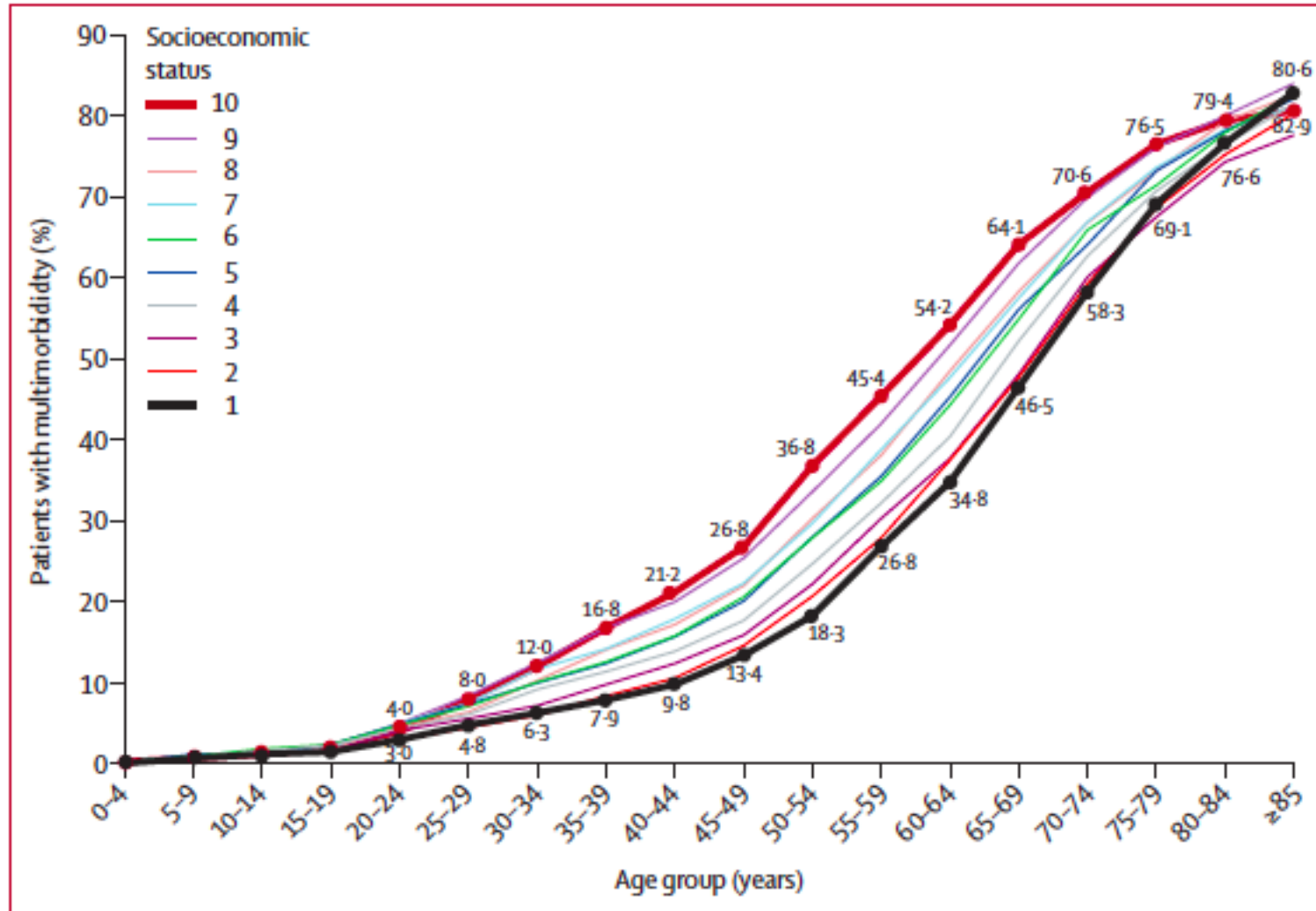
# Common risk factors of major NCDs

	Tobacco use	Unhealthy diets	Physical inactivity	Harmful use of alcohol	Biomass fuel combustion
cardio-vascular diseases	X	X	X	X	X
Diabetes	X	X	X	X	
Cancer	X	X	X	X	X
Chronic respiratory diseases	X		X		X

# Ageing and co-morbidities of NCDs

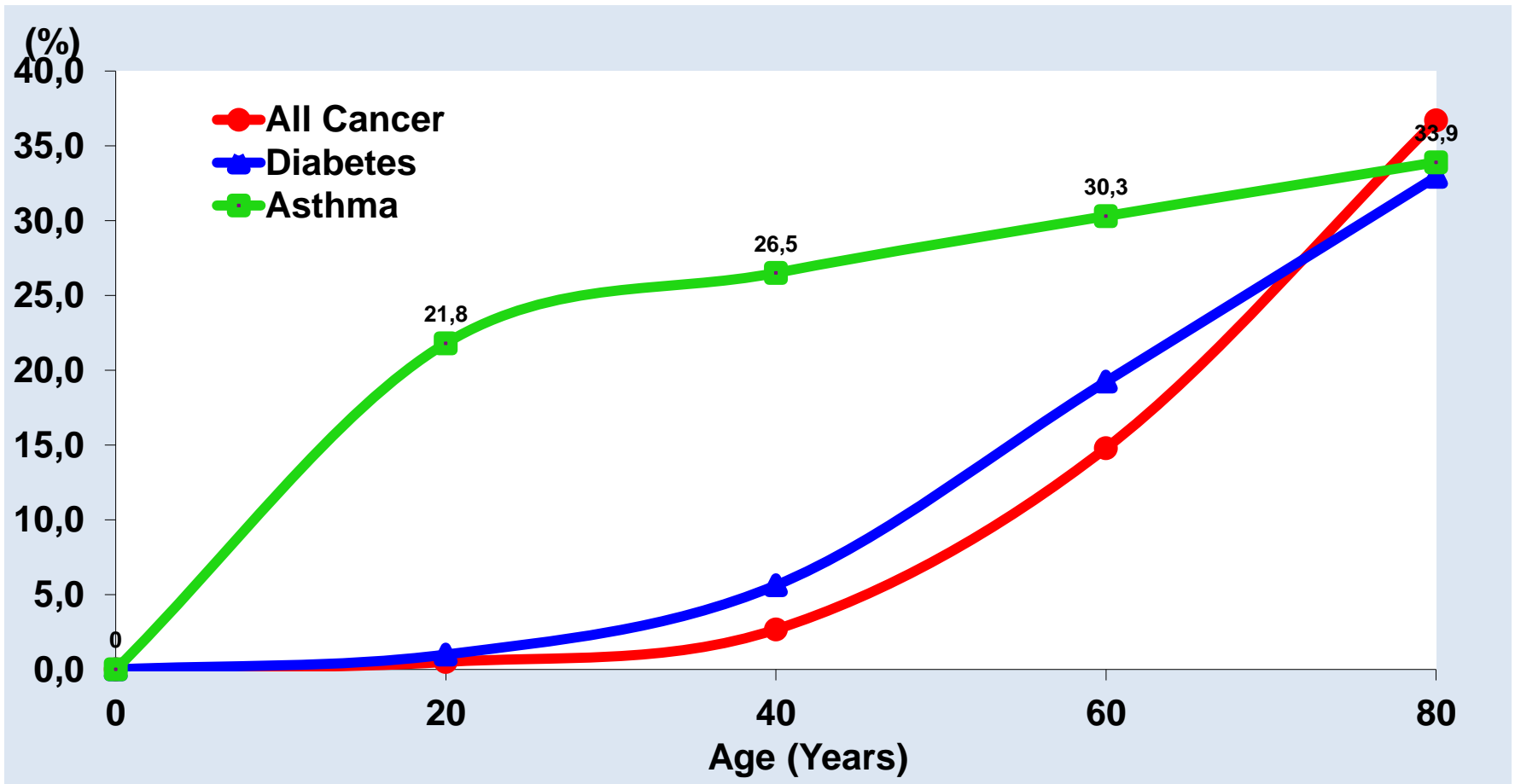


# Chronic diseases cluster in co-morbidities



# Life time risk of chronic diseases

## Ontario



To T, Wang C, Guan J, McLimont S, Gershon AS. What is the lifetime risk of physician diagnosed asthma in Ontario, Canada? *Am J Respir Crit Care Med.* 2010 Feb 15;181(4):337-43

# **Systems Approach in Multifactorial Chronic Diseases with Co-Morbidities**

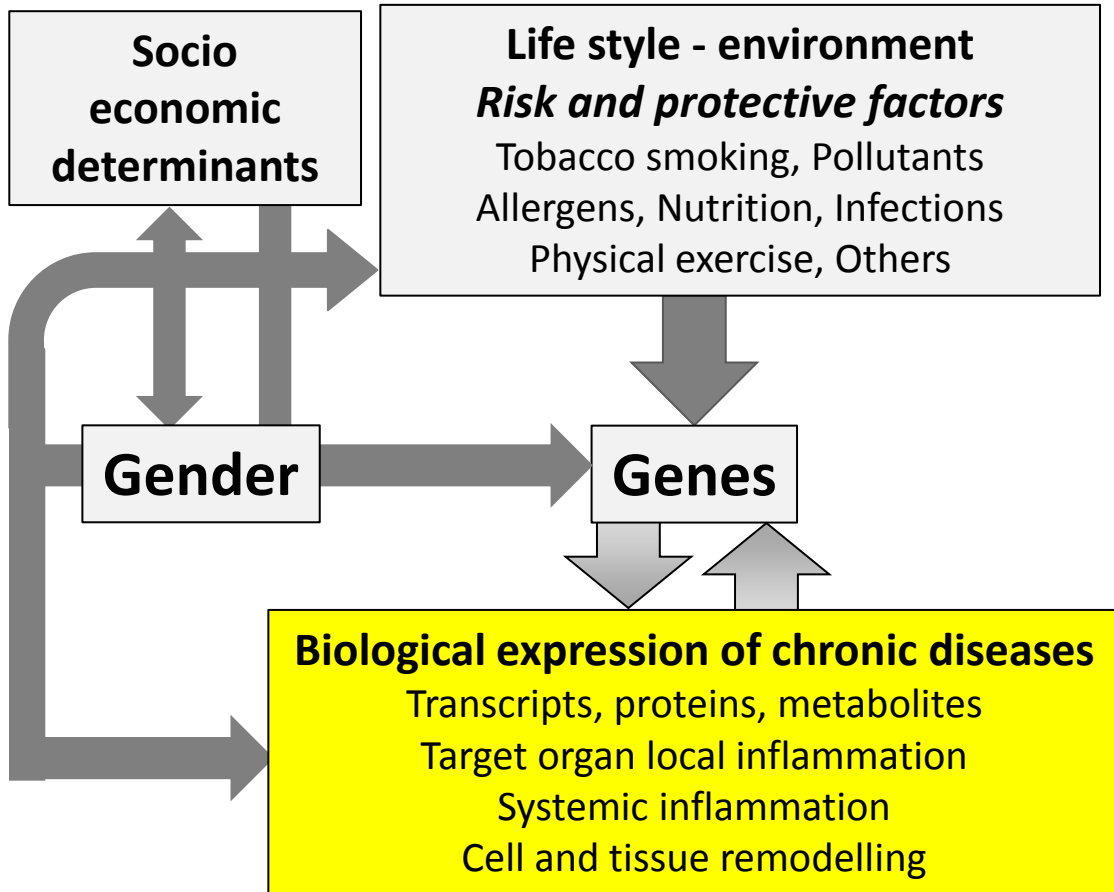
1- Chronic diseases: the global health priority

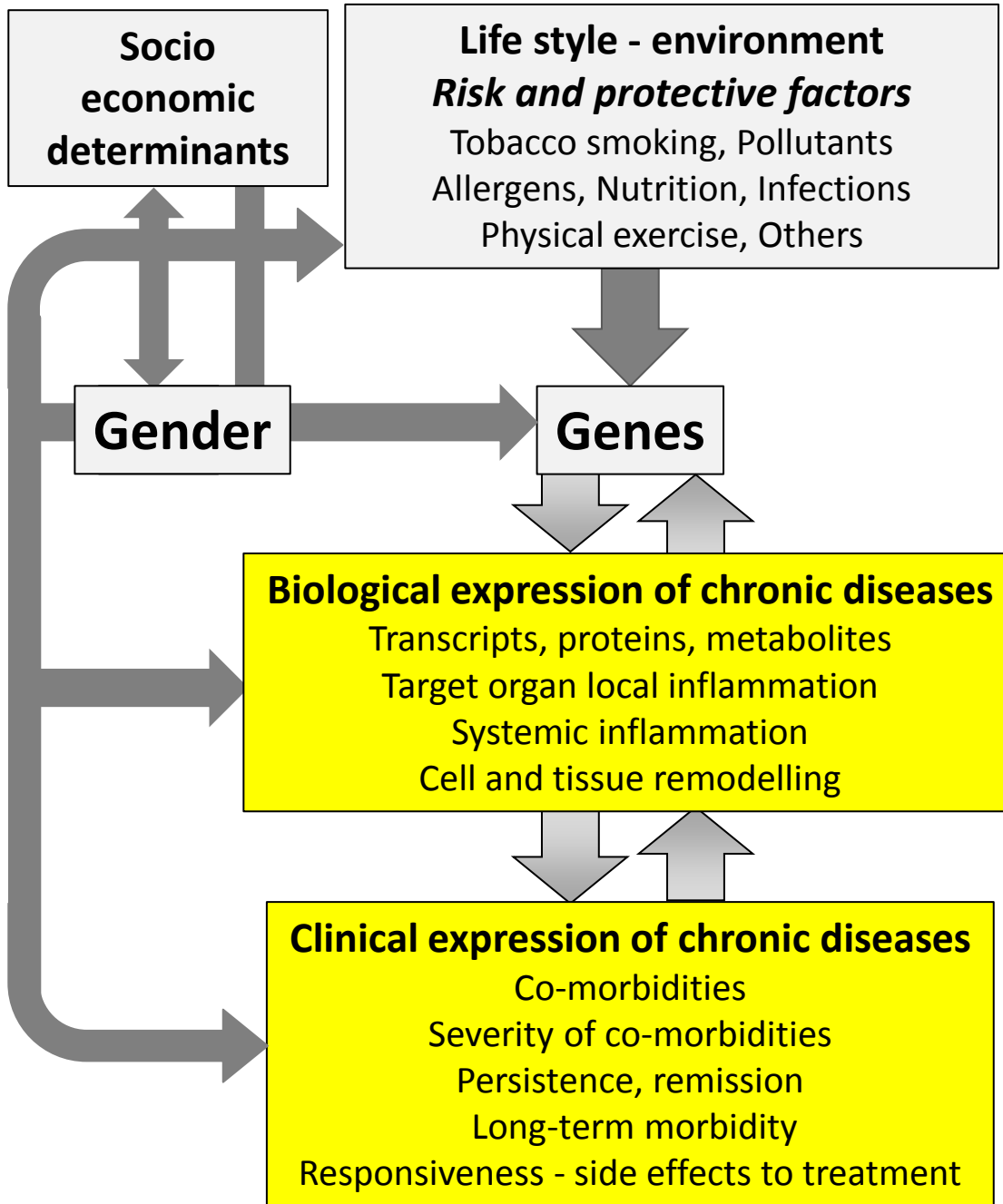
**2- Systems biology to understand the complexity of chronic diseases**

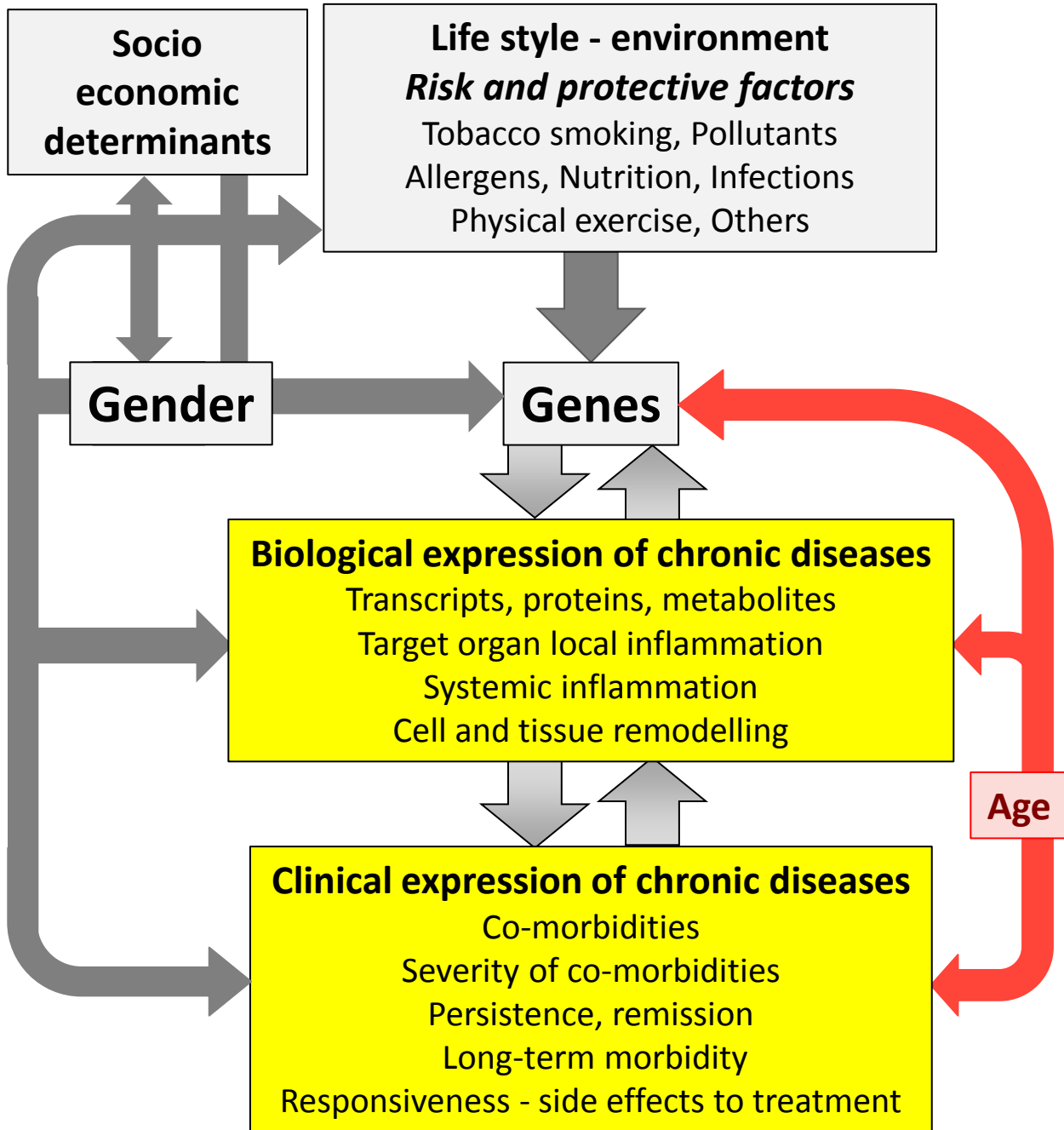


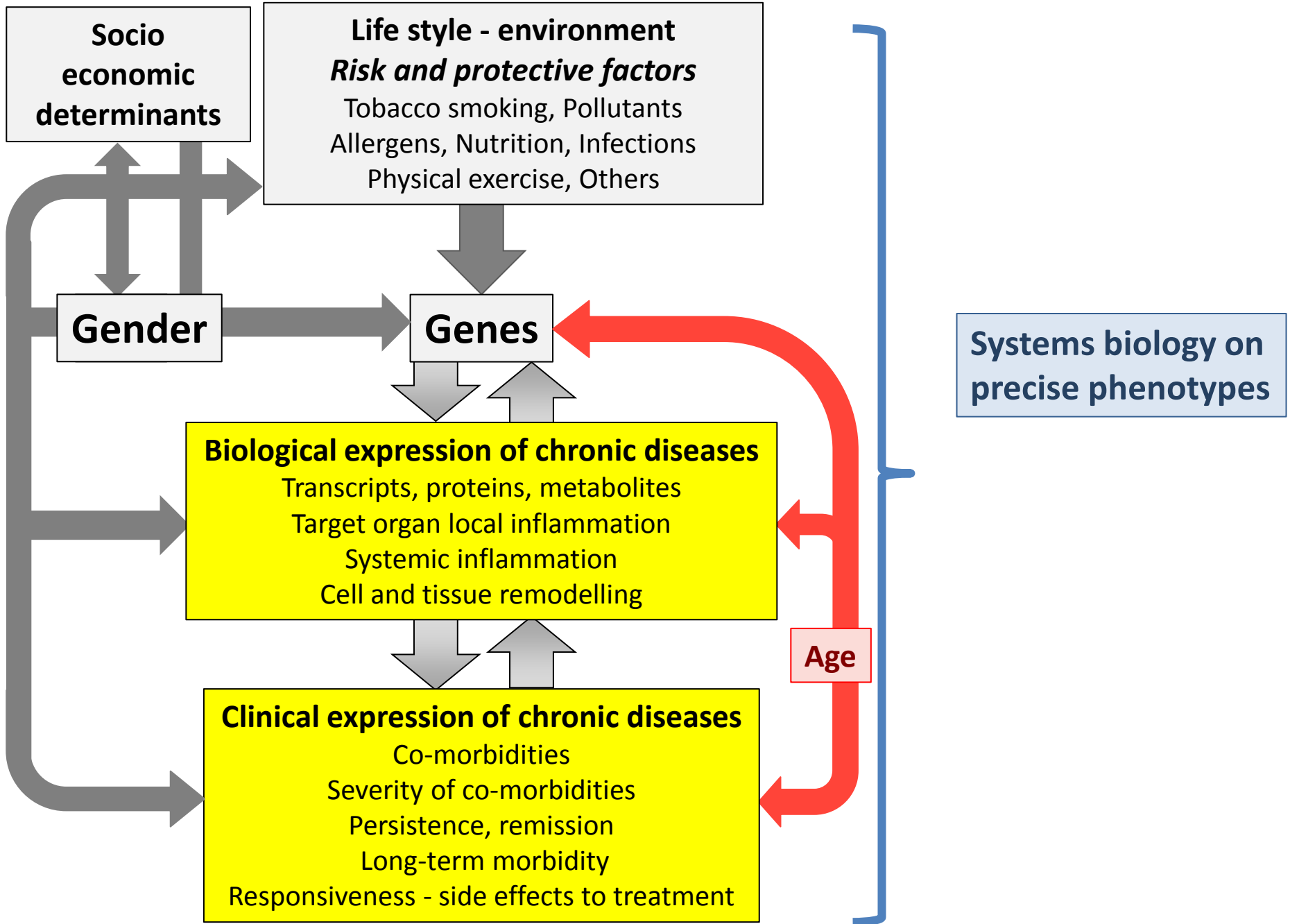
**Socio  
economic  
determinants**

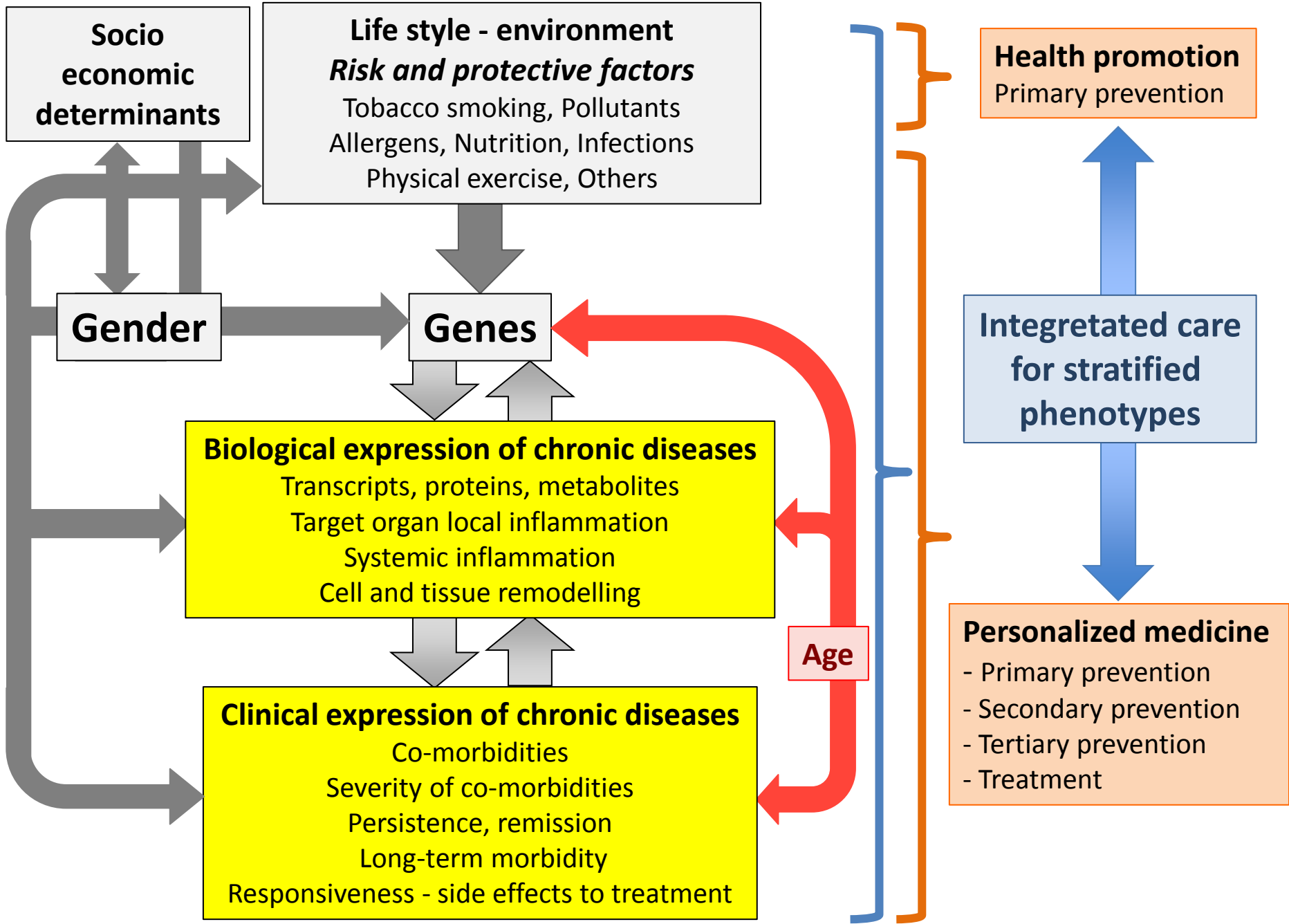
**Life style - environment**  
***Risk and protective factors***  
Tobacco smoking, Pollutants  
Allergens, Nutrition, Infections  
Physical exercise, Others











**Socio economic determinants**

**Life style - environment**  
*Risk and protective factors*  
 Tobacco smoking, Pollutants  
 Allergens, Nutrition, Infections  
 Physical exercise, Others

**Gender**

**Genes**

**Biological expression of chronic diseases**  
 Transcripts, proteins, metabolites  
 Target organ local inflammation  
 Systemic inflammation  
 Cell and tissue remodelling

**Clinical expression of chronic diseases**  
 Co-morbidities  
 Severity of co-morbidities  
 Persistence, remission  
 Long-term morbidity  
 Responsiveness - side effects to treatment

**Age**

**Health promotion**  
 Primary prevention

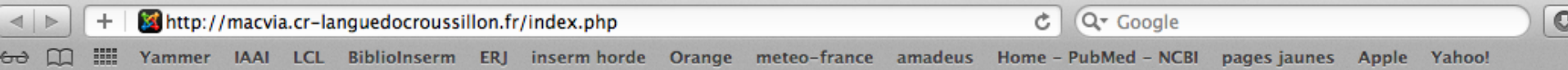
**Integretated care for stratified phenotypes**

**Personalized medicine**  
 - Primary prevention  
 - Secondary prevention  
 - Tertiary prevention  
 - Treatment

# **Systems Approach in Multifactorial Chronic Diseases with Co-Morbidities**



- 1- Chronic diseases: the global health priority
- 2- Systems biology to understand the complexity of chronic diseases
- 3- Integrated approach to re-define and stratify chronic diseases**

# Fighting chronic diseases for active and Healthy ageing in Languedoc Roussillon



# MACVIA\*LR

contre les MALADIES Chroniques  
pour un Vieillessement Actif  
en LANGUEDOC-ROUSSILLON

Taille de la police Augmenter Réinitialiser Diminuer  

ACCUEIL

ENJEUX

INITIATIVES

PARTENARIATS

Vous êtes ici : [Accueil](#)

- Qui sommes nous ?
- Le projet MACVIA\*LR
- Nos engagements
- Documents
- Agenda
- Connexion



## Combattre les maladies chroniques pour un vieillissement en bonne santé

Le Languedoc Roussillon porteur d'un projet innovant, intégré et en réseau

Centré autour de tous les patients de la Région

En partenariat avec les acteurs publics et privés de la Région (et au delà)

Pour réduire les hospitalisations pour maladies chroniques de 30% en 2020 chez les sujets de plus de 65 ans

Avec un fort impact socio-économique régional

En liaison avec le EIP-AHA (UE)

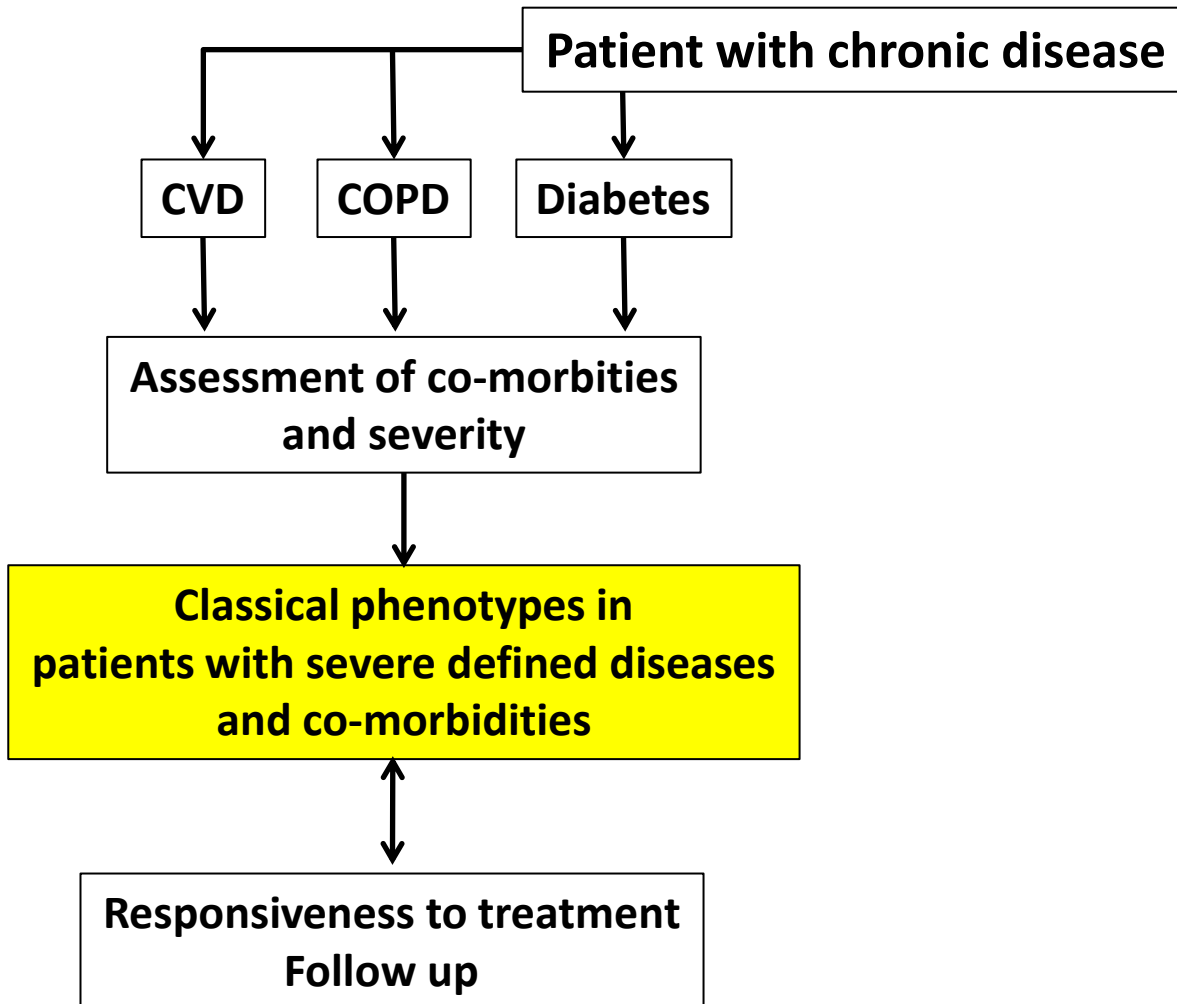
Calendar for MARS 2013:

Lun	Mar	Mer	Jeu	Ven	Sam	Dim
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31



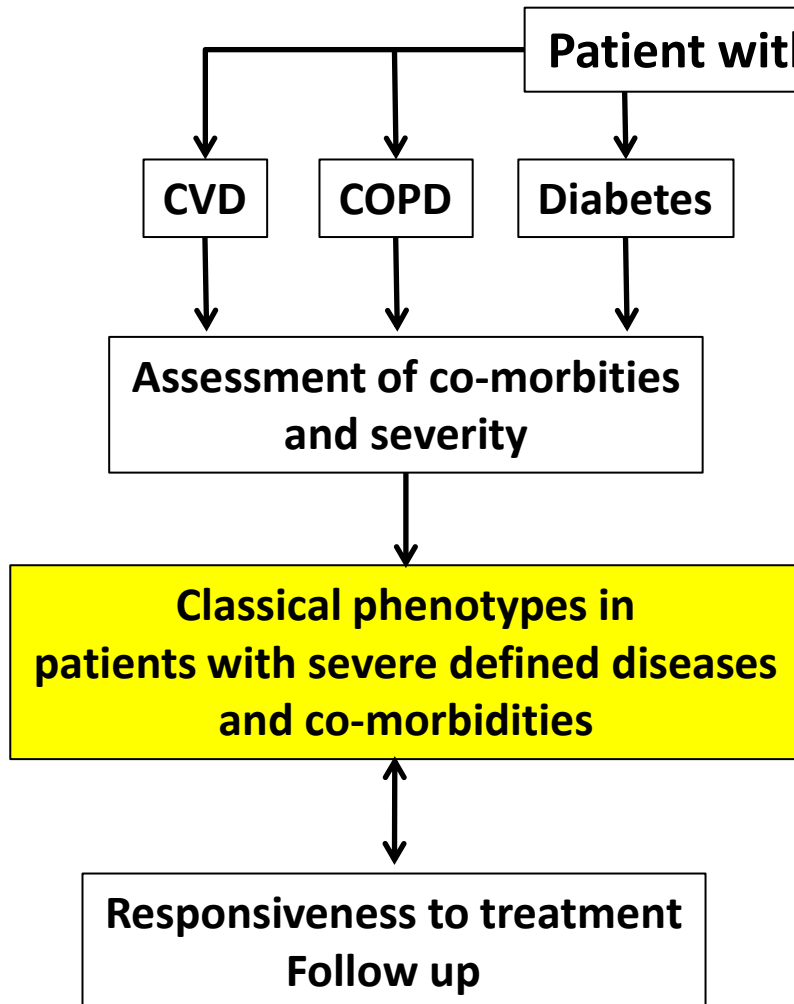
# Classical phenotypes

## Hypothesis-driven



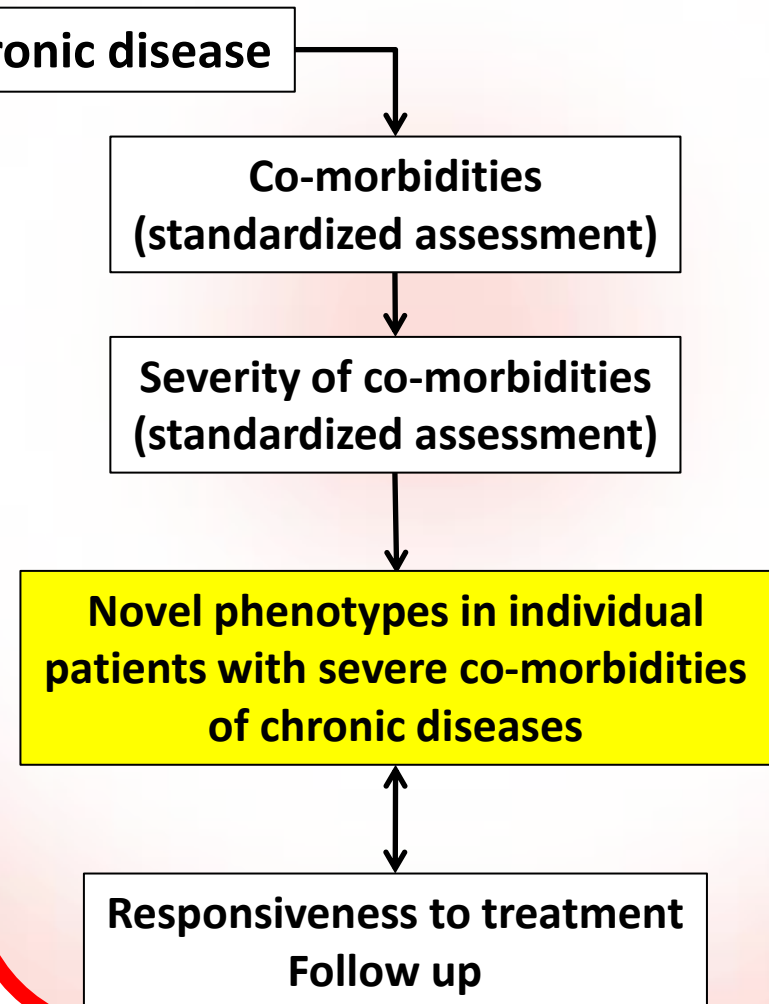
## Classical phenotypes

Hypothesis-driven



## Novel phenotypes

Discovery driven



# Definition of severe asthma (Geneva, 6-7 April 2009)

## *Workshop summary*

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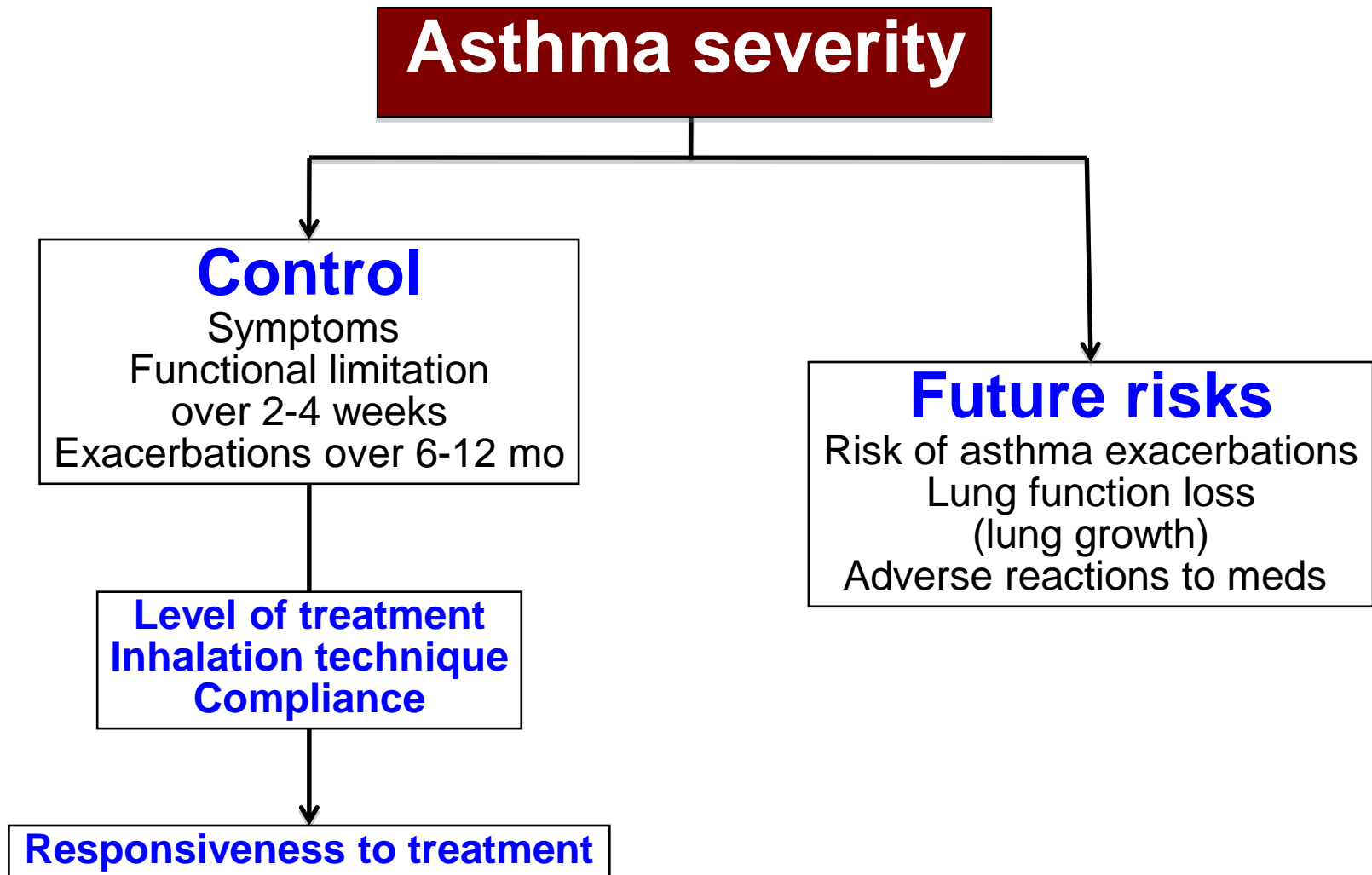
### **Uniform definition of asthma severity, control, and exacerbations: Document presented for the World Health Organization Consultation on Severe Asthma**

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Jean Bousquet, MD, PhD,<sup>a,b</sup> Eva Mantzouranis, MD, PhD,<sup>d</sup> Alvaro A. Cruz, MD,<sup>e</sup> Nadia Ait-Khaled, MD, PhD,<sup>f</sup>  
Carlos E. Baena-Cagnani, MD,<sup>g</sup> Eugene R. Bleecker, MD,<sup>h</sup> Chris E. Brightling, MRCP, PhD,<sup>i</sup>  
Peter Burney, MA, MD, FRCP, FFPH, FMedSci,<sup>j</sup> Andrew Bush, MD, FRCP, FRCPCH,<sup>k</sup> William W. Busse, MD,<sup>n</sup>  
Thomas B. Casale, MD,<sup>o</sup> Moira Chan-Yeung, MD,<sup>p</sup> Rongchang Chen, MD,<sup>q</sup> Badrul Chowdhury,<sup>r</sup>  
Kian Fan Chung, DSc, MD,<sup>l</sup> Ronald Dahl, MD, DrMedSci,<sup>z</sup> Jeffrey M. Drazen, MD,<sup>t</sup> Leonardo M. Fabbri, MD,<sup>u</sup>  
Stephen T. Holgate, MD, DSc,<sup>v</sup> Francine Kauffmann, MD,<sup>b,c</sup> Tari Haahtela,<sup>w</sup> Nikolai Khaltaev,<sup>x</sup> James P. Kiley, PhD,<sup>y</sup>  
Mohammad R. Masjedi,<sup>aa</sup> Yousser Mohammad, MD,<sup>bb</sup> Paul O'Byrne, MB, FRCPI, FRCP(C), FRCPE, FRCP(Glas),<sup>cc</sup>  
Martyn R. Partridge, MD,<sup>nn</sup> Klaus F. Rabe,<sup>dd</sup> Aikis Togias, MD,<sup>z</sup> Christiaan van Weel, MD, PhD,<sup>oo</sup> Sally Wenzel,<sup>ff</sup>  
Nanshan Zhong, MD,<sup>g</sup> and Torsten Zuberbier,<sup>gg</sup> *Montpellier, Villejuif, and Paris, France, Geneva, Switzerland, Brazil, Cordoba,*

# Asthma severity

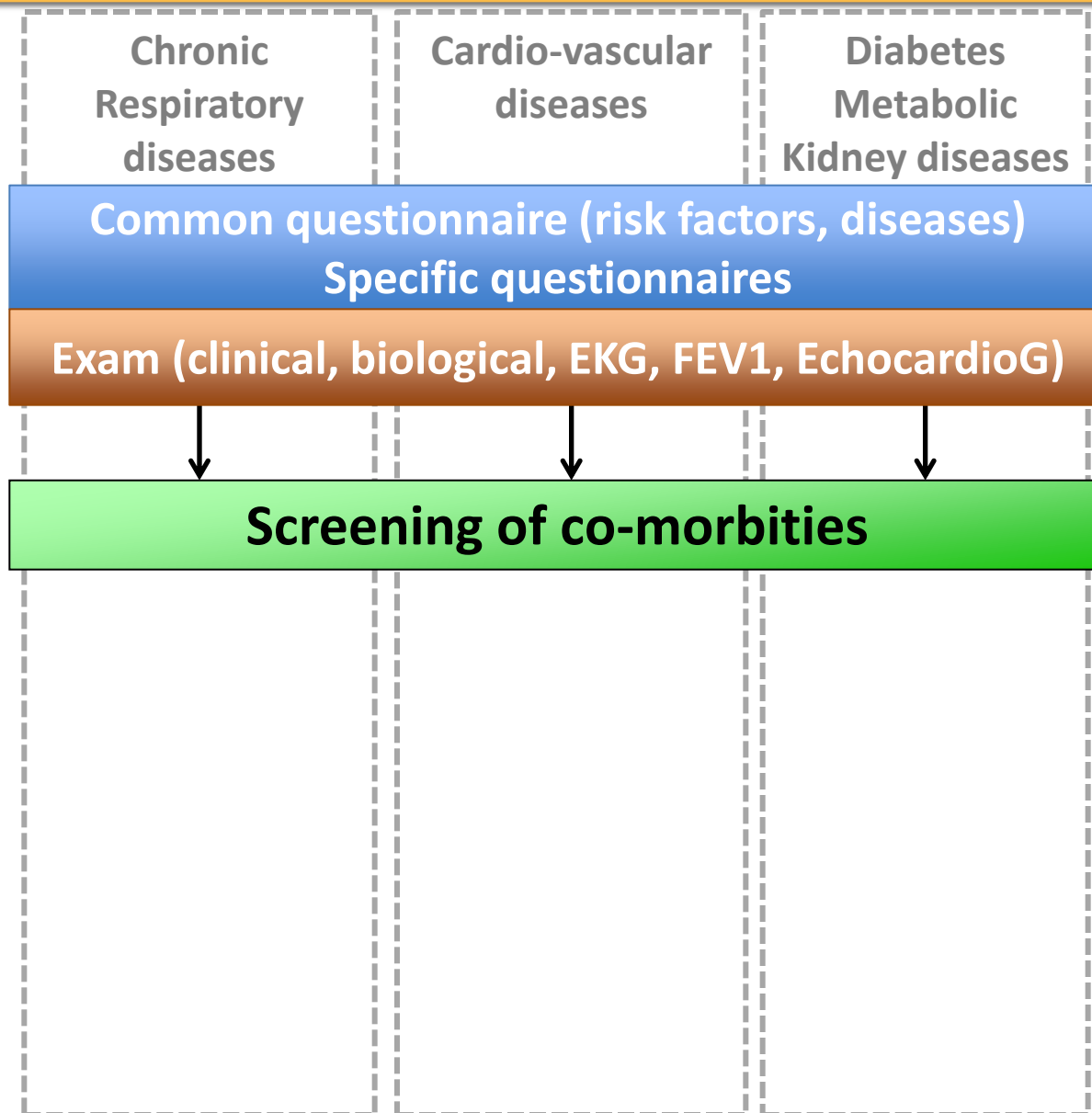
Based on NAEPP, 2007



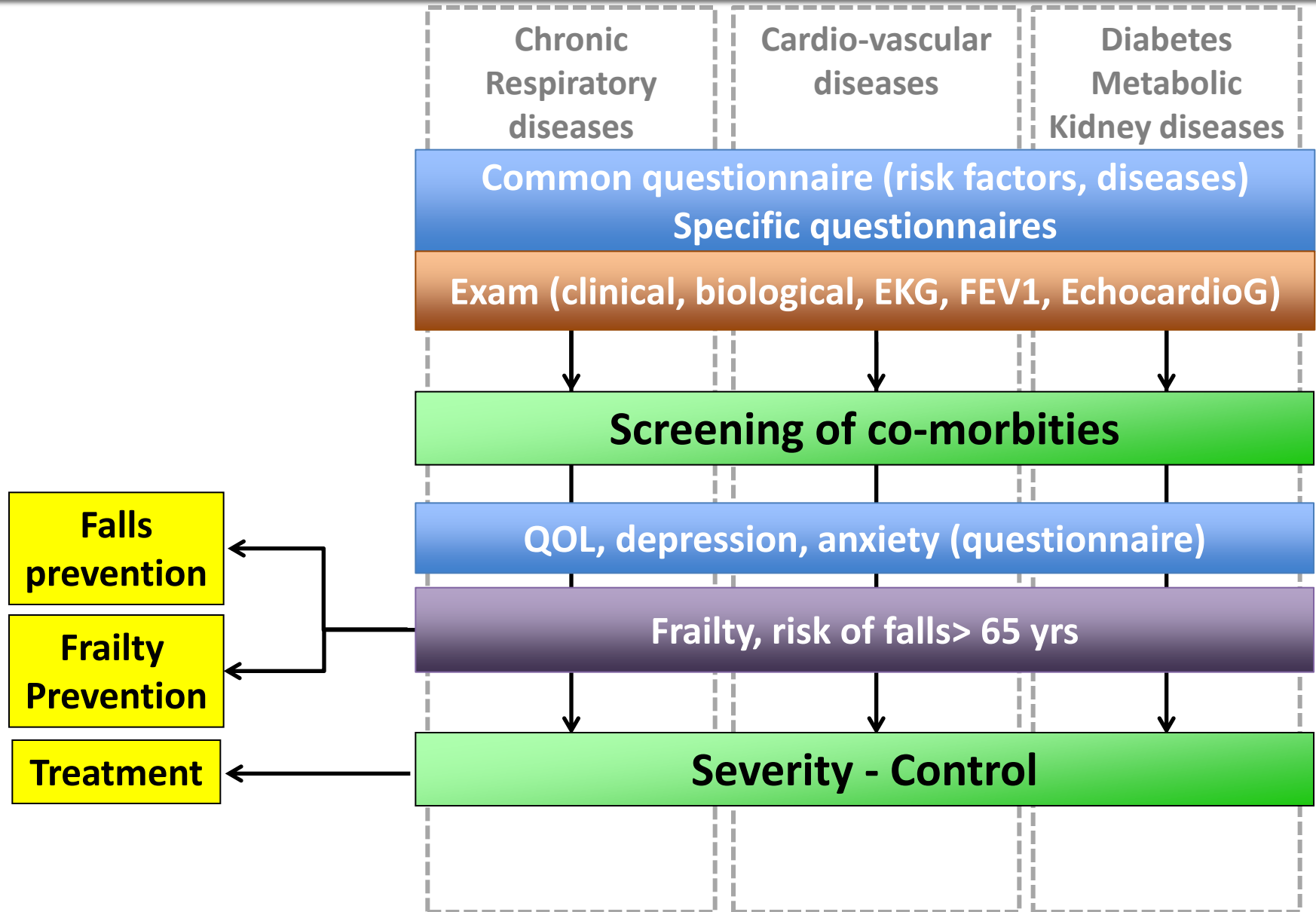
# Uniform severity of chronic diseases

	<b>Asthma</b>	<b>Diabetes</b>
<b>Underdiagnosis</b>	Risk of acute exacerbation	<b>Risk of coma and death</b>
<b>Effective treatment</b>	ICS, $\beta$ 2 agonists	<b>Insulin, oral drugs</b>
<b>No treatment available/affordable</b>	Risk of acute exacerbation	<b>Risk of coma and death</b>
<b>Incorrect diagnosis</b>	COPD (adults) CF (children)	<b>Weight loss</b>
<b>Difficult-to-treat disease</b>	Compliance Inhaler misuse Risk factors	<b>Compliance Complications Risk factors</b>
<b>Controlled treatment dependent disease</b>	Risk of exacerbation when treatment stopped	<b>Risk of death when treatment stopped</b>
<b>Uncontrolled treatment resistant disease</b>	Treatment resistant asthma: Risks	<b>Insulin-resistant diabetes Risks</b>

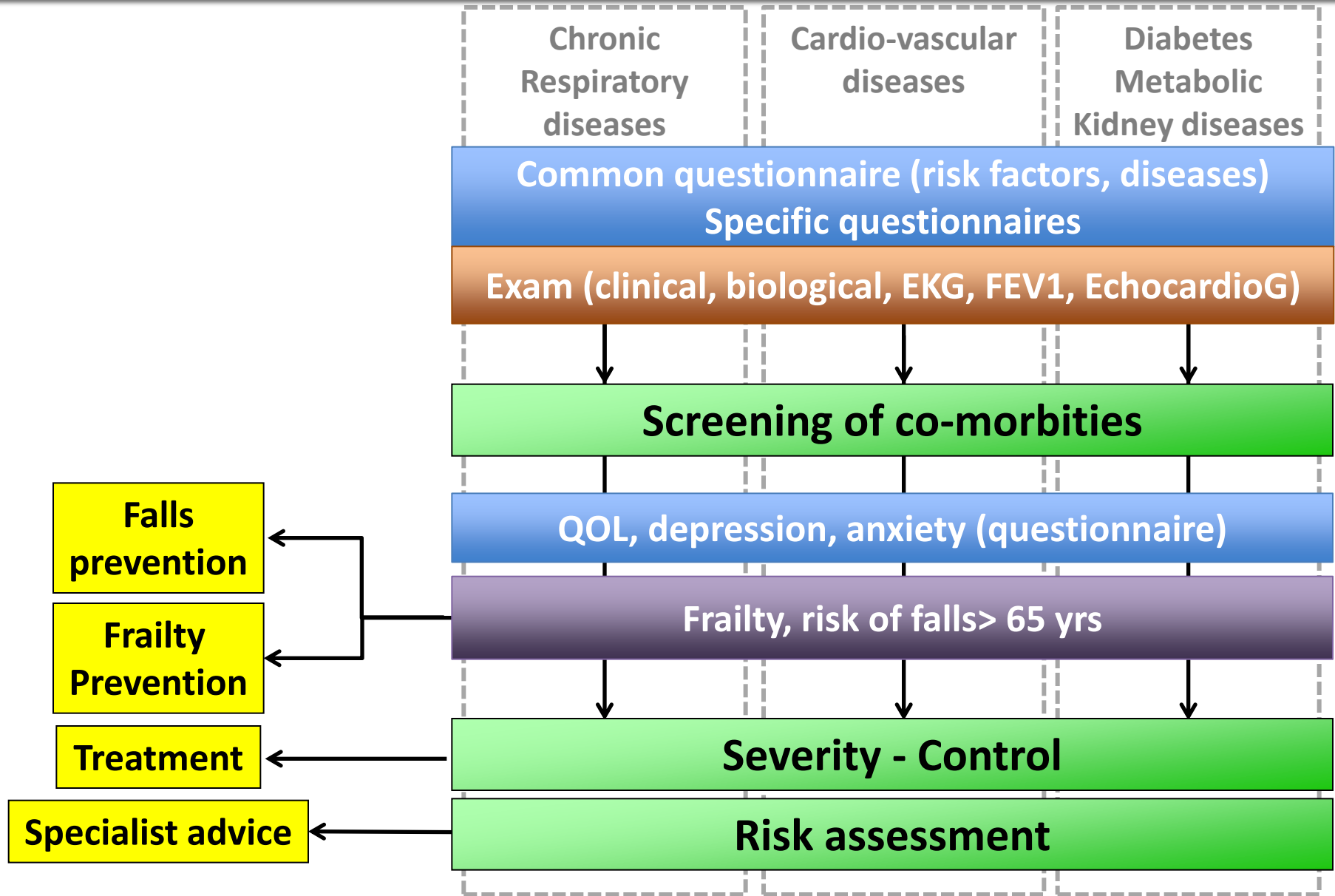
# Chronic disease clinic



# Chronic disease clinic



# Chronic disease clinic





# Physicians in rural areas

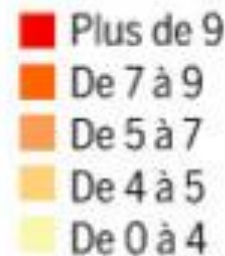
*Le Monde* 7 avril 2012



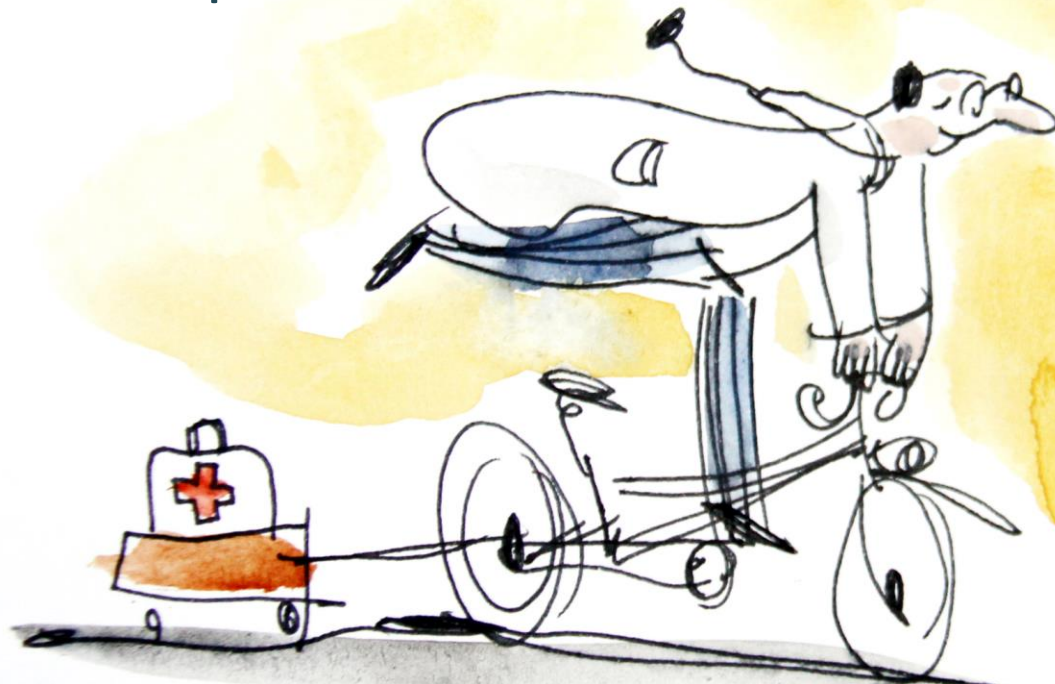
**Nombre de médecins généralistes libéraux\* pour 100 000 habitants**



**Nombre de médecins généralistes libéraux\* de moins de 40 ans pour 100 000 habitants**



Dépistage de **Proximité**  
des **Pathologies**  
**Associées** aux maladies  
chroniques



- Département de  
médecine générale de  
MTP-Nîmes

- CHU de Nîmes

# Systems Approach in Multifactorial Chronic Diseases with Co-Morbidities

- 1- Chronic diseases: the global health priority
- 2- Systems biology to understand the complexity of chronic diseases
- 3- Integrated approach to re-define and stratify chronic diseases
- 4- Across the life cycle**



## POSITION PAPER

# Prevention and control of childhood asthma and allergy in the EU from the public health point of view: Polish Presidency of the European Union

B. Samoliński<sup>1,\*</sup>, A. Fronczak<sup>2</sup>, P. Kuna<sup>3,\*</sup>, C. A. Akdis<sup>4,\*</sup>, J. M. Anto<sup>5,\*</sup>, A. Z. Białoszewski<sup>1</sup>, P. G. Burney<sup>6,\*</sup>, A. Bush<sup>7,\*</sup>, A. Czupryniak<sup>2</sup>, R. Dahl<sup>8</sup>, B. Flood<sup>9,\*</sup>, G. Galea<sup>10</sup>, M. Jutel<sup>11</sup>, M. L. Kowalski<sup>12,\*</sup>, S. Palkonen<sup>9,\*</sup>, N. Papadopoulos<sup>13,\*</sup>, F. Raciborski<sup>1,\*</sup>, D. Sienkiewicz<sup>14</sup>, A. Tomaszewska<sup>1</sup>, E. Von Mutius<sup>15,\*</sup>, D. Willman<sup>16</sup>, A. Włodarczyk<sup>2</sup>, O. Yusuf<sup>17</sup>, T. Zuberbier<sup>18,\*</sup> & J. Bousquet<sup>19,\*</sup>

<sup>1</sup>Department of Prevention of Environmental Hazards and Allergology, Medical University of Warsaw, Warsaw, Poland; <sup>2</sup>Ministry of Health, Warsaw, Poland; <sup>3</sup>National programs against asthma and the Polish national asthma program – Polasthma, Medical University of Lodz, Łódź, Poland; <sup>4</sup>European Academy of Allergy Clinical Immunology (EAACI), Swiss Institute of Allergy and Asthma Research (SIAF), Christine Kühne-Center for Allergy Research and Education, Davos, Switzerland; <sup>5</sup>Centre for Research in Environmental Epidemiology (CREAL), Barcelona, Spain; <sup>6</sup>Imperial College, London, UK; <sup>7</sup>Imperial College and Royal Brompton Hospital, London, UK; <sup>8</sup>Department of Respiratory Diseases, Aarhus University Hospital, Aarhus, Denmark; <sup>9</sup>European Federation of Allergy and Airways Diseases Patients' Associations (EFA), Brussels, Belgium; <sup>10</sup>WHO Europe, Copenhagen, Denmark; <sup>11</sup>Department of Clinical Immunology, Wrocław Medical University, Wrocław, Poland; <sup>12</sup>Department of Immunology, Rheumatology and Allergy, Medical University of Łódź, Łódź, Poland; <sup>13</sup>Department of Allergy, European Academy of Allergy Clinical Immunology (EAACI), 2nd Pediatric Clinic, University of Athens, Athens, Greece; <sup>14</sup>European Public Health Alliance, Brussels, Belgium; <sup>15</sup>University Children's Hospital, Munich, Germany; <sup>16</sup>Silvermedia, Sp. z o. o. Sp. k., Krakow, Poland; <sup>17</sup>The Allergy & Asthma Institute, Islamabad, Pakistan; <sup>18</sup>Department of Dermatology and Allergy, Charité, Berlin; <sup>19</sup>University Montpellier-1 and Inserm CSEP 1018, WHO Collaborating Center for Asthma and Rhinitis, Montpellier, France

**To cite this article:** Samoliński B, Fronczak A, Kuna P, Akdis CA, Anto JM, Białoszewski AZ, Burney PG, Bush A, Czupryniak A, Dahl R, Flood B, Galea G, Jutel M, Kowalski ML, Palkonen S, Papadopoulos N, Raciborski F, Sienkiewicz D, Tomaszewska A, Von Mutius E, Willman D, Włodarczyk A, Yusuf O, Zuberbier T, Bousquet J. Prevention and control of childhood asthma and allergy in the EU from the public health point of view: an urgent need to fill the gaps. *Allergy* 2012; DOI: 10.1111/j.1398-9995.2012.02822.x.

NEWS AND COMMENTARIES

## Impact of early diagnosis and control of chronic respiratory diseases on active and healthy ageing

### A debate at the European Union Parliament

J. Bousquet<sup>1,2,3</sup>, C.C. Tanasescu<sup>4</sup>, T. Camuzat<sup>5</sup>,  
J.M. Anto<sup>6,7,8,9</sup>, F. Blasi<sup>10,11</sup>, A. Neou<sup>12</sup>, S. Palkonen<sup>13</sup>,  
N.G. Papadopoulos<sup>14,15</sup>, J.P. Antunes<sup>16</sup>, B. Samolinski<sup>17</sup>,  
P. Yiallourous<sup>18</sup>, T. Zuberbier<sup>12,19,20</sup>

Allergy **68** (2013) 555–561





## **The role of developmental determinants of chronic diseases and frailty in ageing: From science to value creation and policies**

**Région Languedoc Roussillon (MACVIA-LR, EIP on AHA Reference Site)**

**University Montpellier 1**

**CHRU Montpellier and Nîmes**

**MeDALL (Mechanisms of the Development of Allergy, FP7)**

**European Innovation Partnership on Active and Healthy Ageing: DG Sanco and DG CONNECT**

**Framework Programme 7, DG Research**

**National Institute of Allergy and Infectious Diseases (NIH)**

Proposal following the recommendations of the EU Council of the Polish (2011)  
and Cyprus (2012) Presidencies

Montpellier, 2-3 December 2013

# **Systems elements for integrated care in multifactorial chronic diseases with co-morbidities**

- 1- Chronic diseases: the global health priority**
- 2- Systems biology to understand the complexity of chronic diseases**
- 3- Integrated approach to re-define and stratify chronic diseases**
- 4- Chronic diseases tackled across the life cycle**