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Risk of allergies among migrants in Europe: a further area of application of the hygienic hypothesis?

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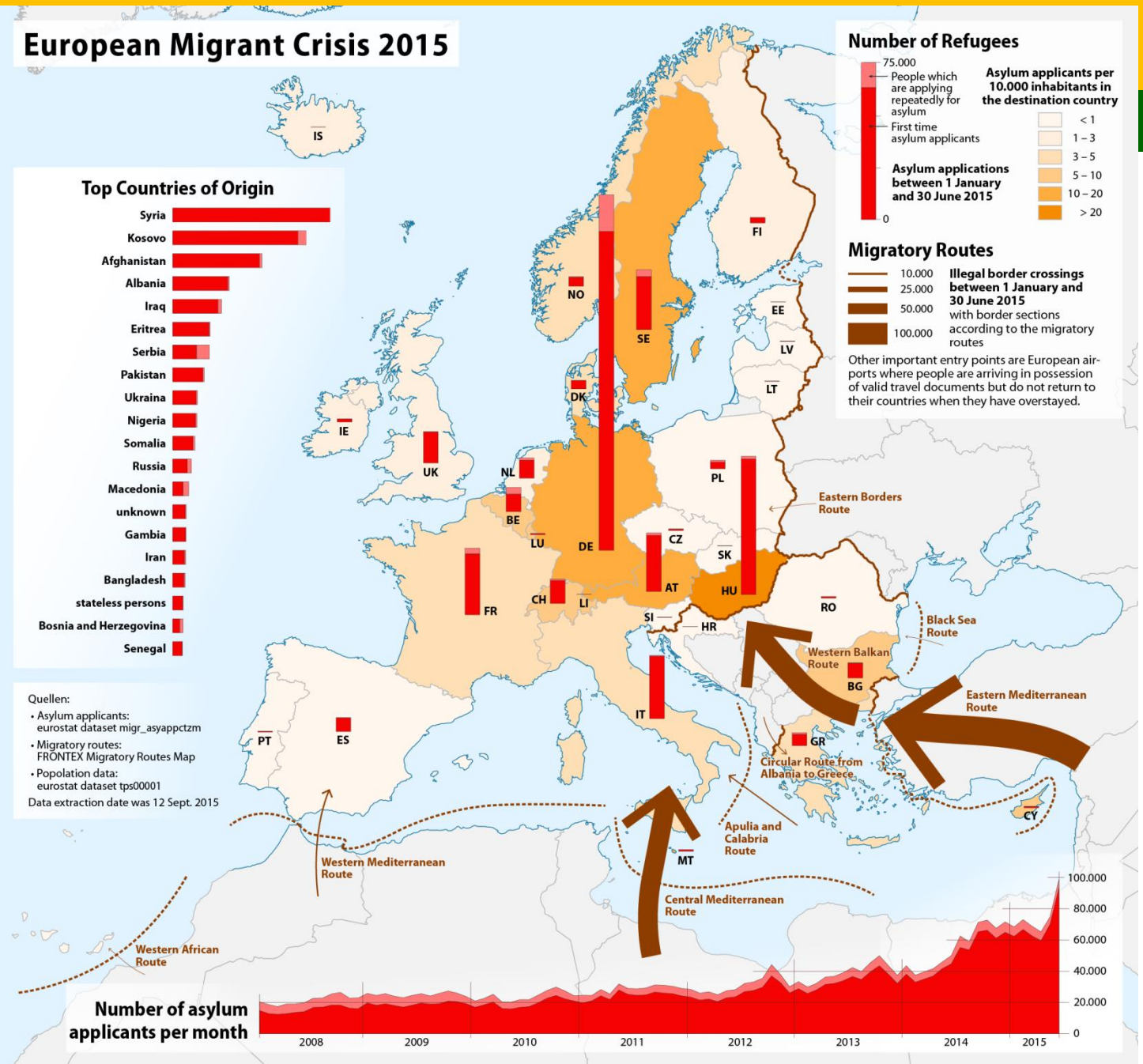
Migrant flows (1)

- Nearly 3% of the world's population are migrants.
- Over the past 35 years the number of international migrants has more than doubled to 175 million – 1 of every 35 people
- 2.4 million immigrants entered the EU-27 from non-EU-27 countries in 2018.
- Around 6.1 thousand stateless

(Eurostat, 2014; Eurostat 2018)

Migrant flows (1)

- 21.8 million people (4.9 %) of the 446.8 million people living in the EU-27 on 1 January 2019 were non-EU-27 citizens.
- Almost 104 thousand were refugees
- Over 20 thousand authorized to stay for humanitarian reasons (Eurostat, 2014)
- The total number of undocumented migrants in Europe is estimated between 5 to 8 million (GCIM 2005).


European Migrant Crisis 2015
Number of Refugees
75.000
People which are applying repeatedly for asylum
First time asylum applicants
Asylum applications between 1 January and 30 June 2015
0
Asylum applicants per 10.000 inhabitants in the destination country
< 1
1 – 3
3 – 5
5 – 10
10 – 20
> 20
Migratory Routes
10.000
25.000
50.000
100.000
Illegal border crossings between 1 January and 30 June 2015 with border sections according to the migratory routes
Other important entry points are European airports where people are arriving in possession of valid travel documents but do not return to their countries when they have overstayed.
Top Countries of Origin
Syria
Kosovo
Afghanistan
Albania
Iraq
Eritrea
Serbia
Pakistan
Ukraina
Nigeria
Somalia
Russia
Macedonia
unknown
Gambia
Iran
Bangladesh
stateless persons
Bosnia and Herzegovina
Senegal
Quellen:
• Asylum applicants: eurostat dataset migr_asyappctzm
• Migratory routes: FRONTEX Migratory Routes Map
• Popolation data: eurostat dataset tps00001
Data extraction date was 12 Sept. 2015
IS
NO
SE
FI
EE
LV
LT
DK
IE
UK
NL
BE
LU
DE
PL
CZ
SK
AT
HU
FR
CH
LI
SI
HR
RO
IT
PT
ES
MT
BG
GR
CY
Eastern Borders Route
Black Sea Route
Western Balkan Route
Eastern Mediterranean Route
Circular Route from Albania to Greece
Apulia and Calabria Route
Western Mediterranean Route
Central Mediterranean Route
Western African Route
Number of asylum applicants per month
100.000
80.000
60.000
40.000
20.000
0
2008
2009
2010
2011
2012
2013
2014
2015

Undocumented migrants

- May be from 5 to 8 million
- Between 10 and 15 % of Europe's 56 mil
  irregular status
- Each year half a million undocumented r
  (Eurostat, 2014)

- Almost 104 thousand p he
  EU-28 in 2014 (first ins
- Nearly 80 thousand asl
  authorization to stay fo

The report by the Global Co er
2005, (Madrid: Médecins du Monde, 2005)

Migrants and work

- In 2014 15.2 million “official” migrants at work (7.0 % of total EU employment).

- 7.3 million citizens from another EU Member State; 7.9 million non-EU citizens.

- Distribution : agriculture, manufacturing, construction, restaurants.

Source (Eurostat 2014)

Migrants and work : irregular work

- Austria: 109,000 migrant workers were employed full time in undeclared jobs in 2002
- In Italy (Lombardy region): 55.3% of men are estimated to work as employees in regular employment and 14.4% in undeclared employment. Women 59.7%, undeclared 19.7%.
- In France :a correlation is found between recruitment difficulties in specific sectors – such as construction, hotels and restaurants, retail and agriculture – and the illegal employment of foreigners (European Foundation for the Improvement of Living and Working Conditions, 2007)
- They are less likely to have a permanent job contract than are native-born workers, and poorer health to be associated with the lack of a permanent job contract (Sousa et al, 2010).

What do they do?

- Worse employments (“three D”), particularly non-EU citizens:
- Migrant women: further disadvantaged group
- Different lifestyles
- Poor housing
- Poor working conditions; no social security/legal protection
- Over-qualification

(Source : Access to Health Care for Undocumented Migrants in Europe , PICUM : Platform for International Cooperation on Undocumented Migrants Gaucheretstraat 164 1030 Brussels

The Risky Exposures of Migrants

- Temperature. migrant workers employed in natural resources, construction, and maintenance often work outside and are subject to extreme weather exposure
- Pesticides. Among the 2 million agricultural workers in the United States, an estimated 10,000– 20,000 pesticide injuries are medically treated each year (Niosh, 2017)
- Chemicals. Exposure to dangerous chemicals is common in many of the industries in which immigrants work. Housekeepers in residences or hotels, Hotel cleaners; nail salons; dry cleaning; constructions.
- Physically demanding jobs: . high risk of injuries and fatalities
- Physical hazards: housekeeper changes body position every three seconds while cleaning a guest room. Hotel housekeeping results in the potential for muscle strain related to body position, repetitive motion, fast-paced work, and heavy lifting of cleaning equipment, such as industrial-strength vacuum cleaners ((The Canadian Center for Occupational Safety and Health)

The European Working Conditions Survey

- Analyzed nearly 30,000 workers in 31 European countries
- higher rates of negative occupational exposures among migrants when compared with native workers.
- More likely than native workers to be exposed to high temperatures, loud noises, strong vibrations, and fast work speeds and to stand for long periods of time.

The European Working Conditions Survey,

- Often worked without contracts and had unfavorable work schedules
- The industries most likely to employ migrant workers are often those that carry the most risk for adverse worker health.
- According to the US Census of Fatal Occupational Injuries, 15% more likely to be fatally injured on the job than native-born counterparts
- Less likely to have a permanent job contract
- Greater reporting of poorer health to be associated with the lack of a permanent job contract

And what about their health?

- Worldwide, higher rates of negative occupational exposures, leading to poor health outcomes, workplace injuries, and occupational fatalities.
- In 2014, 2.3 million occupational fatalities from a variety of different sources (ILO, 2014)
- The higher rates of occupational fatalities among attributed to inherent risks in the jobs themselves and the lack of training and protection
- The incidence decreases over time from migration

Migrants and Covid Pandemic

- They come from the countries where the epidemics is worse
- They live in conditions in which close contacts and infections are possible
- An Italian study: proportions of natives and migrants among the COVID-19-related deaths (97.5% and 2.5%, respectively) were similar to the relative all-cause mortality rates estimated in Italy in 2018 (97.4% and 2.6%, respectively).
- The clinical phenotype of migrants dying with COVID-19 was similar to that of natives except for the younger age at death. International migrants living in Italy do not have a mortality advantage for COVID-19 and are exposed to the risk of poor outcomes as their native counterparts (Canevelli et al, 2020)

Outstanding issues

- Inequality in access to health care system (diagnosis, treatment, preventive services)
- Respiratory health as case study: non communicable diseases (respiratory allergy);
- A “Healthy Migrant Effect?” (migrants are healthier than non migrants from developing countries of origin to developed world)

(Dijkstra A et al, 2015 - European Journal of Public Health, 25, 6: 944–950)

Mortality in migrants: unexpected data

- Migrant
  (especia
- Turks, M
  relative
- In USA,
  mortalit
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  2004; B
- Asian ir
  Miller, 2

Hazard ratios of cause-specific mortality among male immigrants relative to the UK-born population in England and Wales

Model 2b (male)	Respiratory			Infectious		
	Haz ratio	Sig	95% CI	Haz ratio	Sig	95% CI
Country of birth						
England and Wales	0.26	***	*0.25–0.27*	0.02	***	*0.02–0.03*
Scotland	0.35	***	*0.29–0.43*	0.06	***	*0.04–0.10*
Northern Ireland	0.37	***	*0.26–0.52*	0.01	***	*0.00–0.08*
Republic of Ireland	0.32	***	*0.26–0.39*	0.01	***	*0.00–0.03*
India	0.16	***	*0.13–0.20*	0.06	***	*0.04–0.08*
Pakistan						
Bangladesh						
Jamaica	0.11	***	*0.07–0.16*	0.05	***	*0.02–0.08*
Other Caribbean						
East and Southern Africa	0.10	***	*0.06–0.17*	0.08	***	*0.04–0.15*
West and Central Africa						
Western Europe	0.11	***	*0.08–0.15*	0.02	***	*0.01–0.04*
Eastern Europe						
China	0.15	***	*0.09–0.25*	0.01	***	*0.00–0.08*
Other Asia						
Rest of the World	0.22	***	*0.16–0.31*	0.05	***	*0.02–0.09*

Allergy as a case study: asthma in migrants: from Asia to UK

- Crude prevalence of asthma: 10.9% (95% CI 9.4–12.4) in south Asian women; 21.8% (20.6–22.9) in white women ($P < 0.001$), unadjusted OR of 0.44 (0.37–0.52).
- Factors positively associated with asthma prevalence: being born in the United Kingdom or having migrated before age five, speaking English, eating mostly an English instead of an Asian diet and active smoking. Factors negatively associated: limited education, overcrowding, lack of electricity for cooking and lack of central heating

From Albania to Italy: duration of residence & risk

- Albania: one of the lowest prevalence of allergic diseases, significantly lower than that of several westernized countries including Italy which has similar climatic and aerobiological conditions but a more westernized lifestyle.
- Prevalence of hay fever increased from 2.5% in subjects with duration of residence <3 years to 20.4% in those with a duration of residence longer than 7 years in Apulia Region (South of Italy)
- Prevalence of sensitization to pollens (Skin test) increased from 5.0% in those living in Apulia for <3 years to 28.6% in those living in Apulia for more than 7 years.

(Ventura et al, 2004)

Early life environmental factors influence the risk of adult asthma

And from Turkey to Europe: “Farming Model” complementary to the “migrant model “

- Turkish migrants’ children in European metropolises protected from allergic diseases
- Protection is inversely associated with the level of adaptation to the host country culture
- WHY???
- They live in the same flats as native children
- They are not exposed to cows, cattle, livestock and farming environment
- They preserve some protective factors of the traditional lifestyle

Urban vs Rural

In Europe: Poverty = rural origins

a. Daily exposure to animals and their waste

b. High turnover of orofaecal and food-borne infections

A+b = protection from the atopic phenotype

Towns: environmental risk factors aggravating asthma: smoking, overcrowding, poor ventilation, inadequate heating or faulty air conditioning and cooking gases

Psychosocial risk factors; unawareness of asthma,

dysfunctional families

Inadequate social support

'Poverty' in inner cities: indoor allergens (e.g. cockroaches, rodent urine)

orofaecal infections less relevant

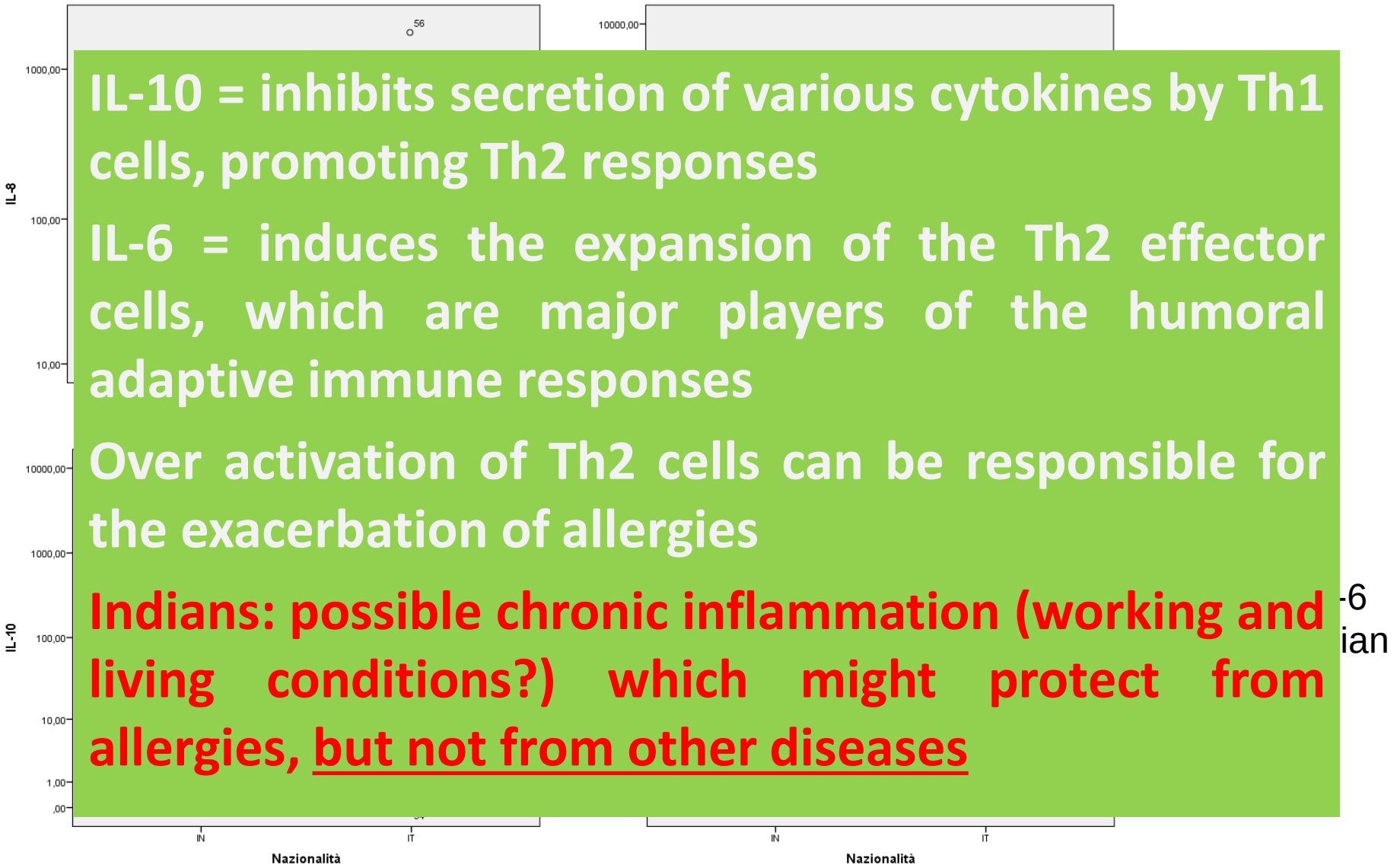
Higher risk for migrants in towns??? ……

From "Farming Model" complementary to the "migrant model"?

Mechanistic explanation = protective role of intracellular pathogens ingested through the faecally contaminated environment and through contaminated soil, water and food.

(The 99th Dahlem Conference on Infection, Inflammation and Chronic Inflammatory Disorders: Controversial aspects of the 'hygiene hypothesis'. Clinical and experimental Immunology doi:10.1111/j.1365-2249.2010.04130.x).

Some data from ICRH (Milano)



IL-10 = inhibits secretion of various cytokines by Th1 cells, promoting Th2 responses

IL-6 = induces the expansion of the Th2 effector cells, which are major players of the humoral adaptive immune responses

Over activation of Th2 cells can be responsible for the exacerbation of allergies

Indians: possible chronic inflammation (working and living conditions?) which might protect from allergies, <u>but not from other diseases</u>

-6
ian

Some conclusions (1)

- Migrants are employed in the most dangerous jobs
- Very often they do not have any contract or they have unfavourable contracts (low salary for dirty job)
- They are much more vulnerable than natives not only because the highest risk exposures but also because of lack of knowledge on safety and health procedures and poor training (language barriers)
- They are exposed also to allergens, but risk of allergies show a particular trend, that is increase over time and over integration!

Some conclusions (2)

- Effect of migration on allergy is age and time dependent: early age and longer time in the new environment increase risk

(D'Amato G, WAO Journal, 2011)

- Protection is inversely associated with the level of integration in the hosting country
- From the "hygienic hypothesis" to the "migrant hypothesis"?
- Mother country: several putative protective factors: high exposure to endotoxins, ingestion of unpasteurized milk, exposure to cattle, rural environment, traditional diet …
- "New" country: peers; diet and contacts with relatives coming from or living in the native land

Thank you for your attention