

Epidemiology and etiology of lymphomas

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Bellinzona



Disclosures

Roche

Celgene

Mundipharma

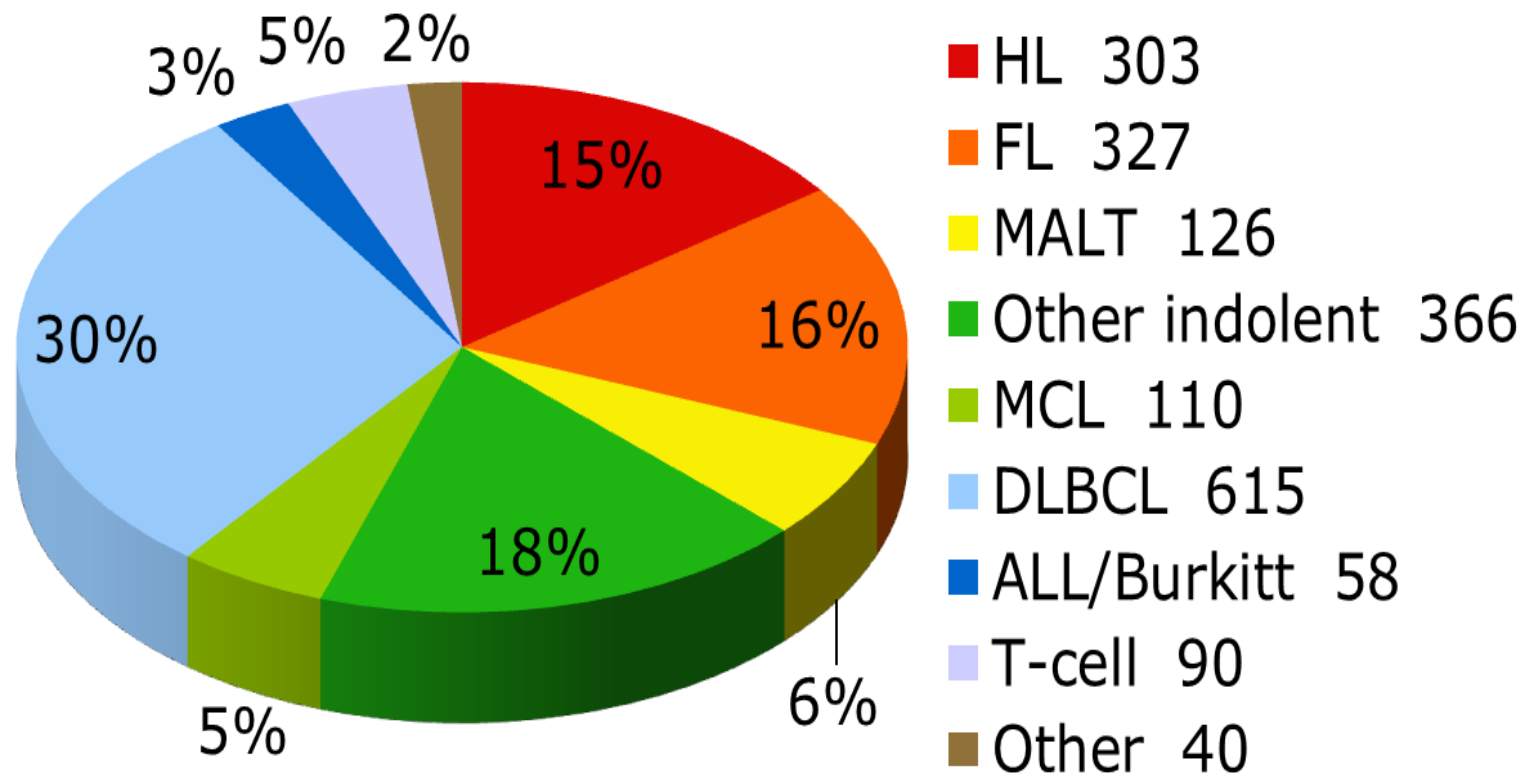
Janssen

Gilead

Bayer

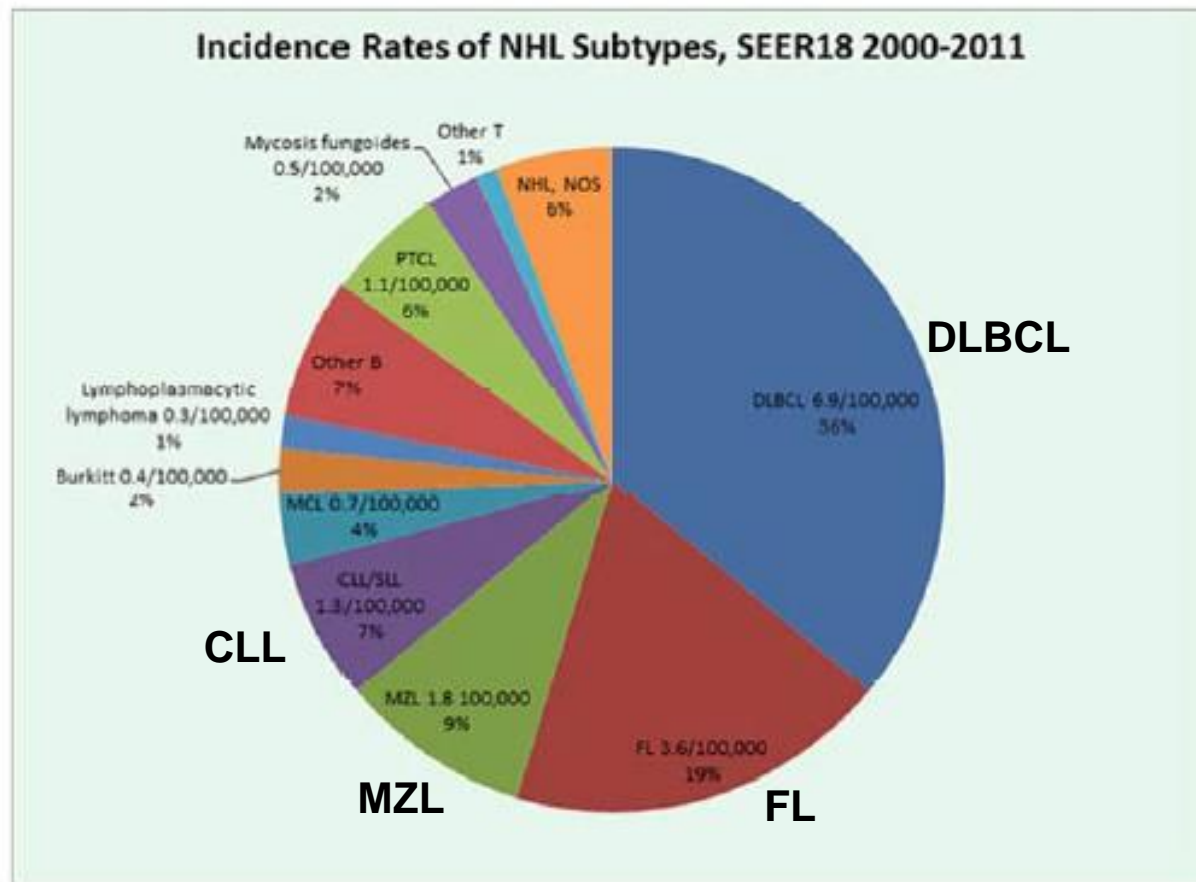
Millenium

Aggressive : 45%
Indolent : 40%
Hodgkin: 15%



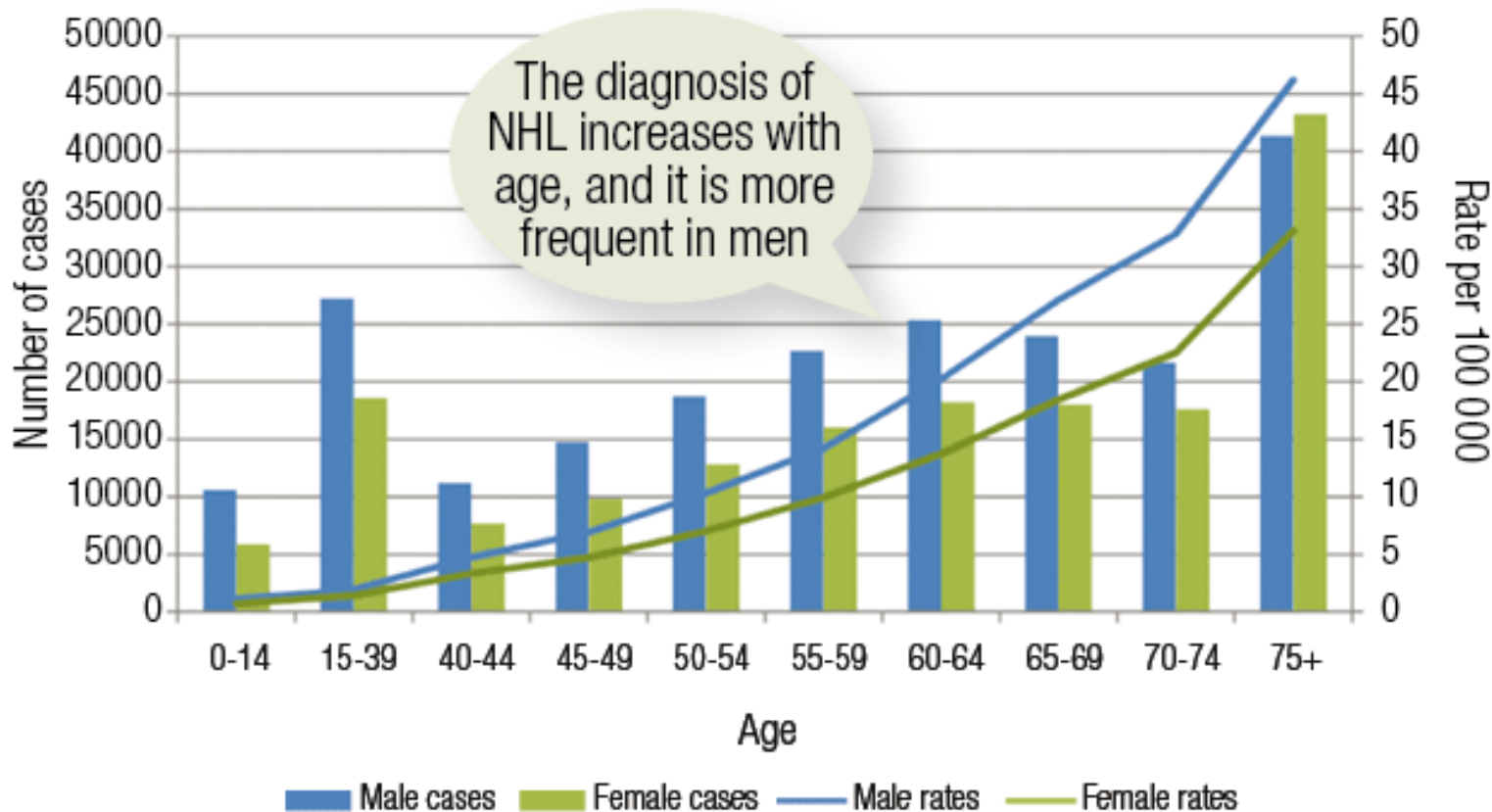
IOSI LYMPHOID NEOPLASMS DATABASE 1980-2011
[N=2035, Median follow-up: 9.8 years]

Incidence of lymphoma in the USA

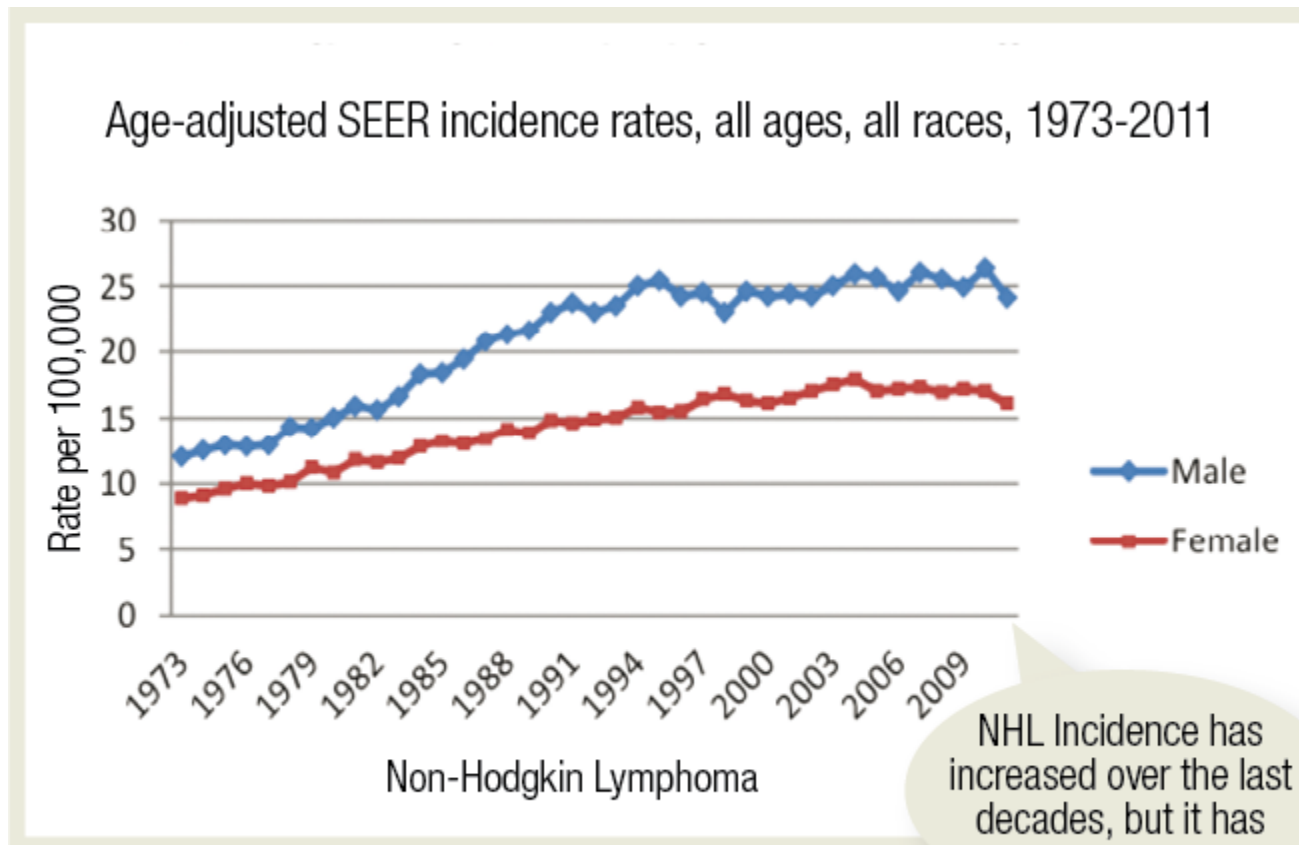


Lymphoma incidence by age

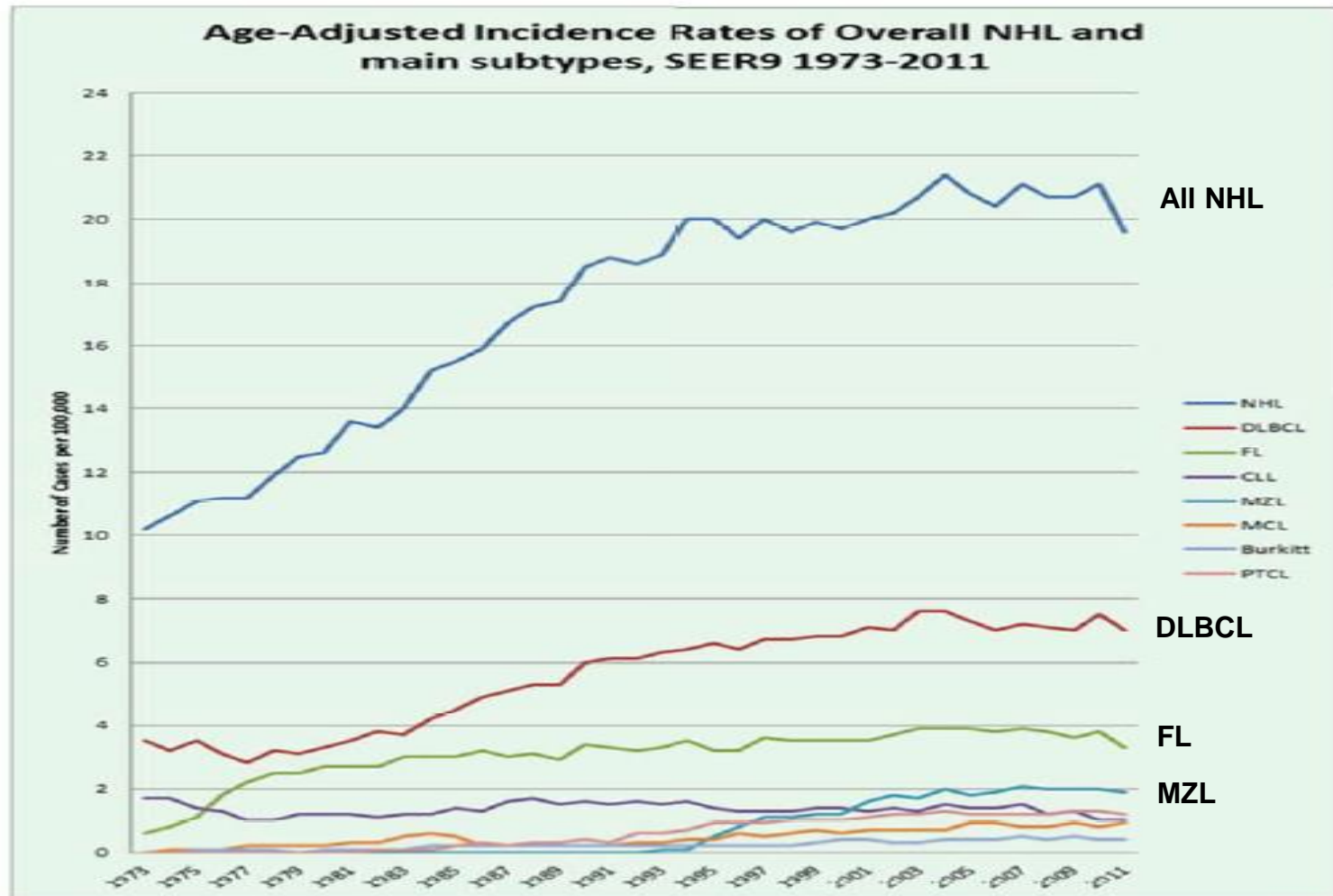
Incidence rates per 100 000 and number of cases
(World - Non-Hodgkin Lymphoma, Globocan 2012)



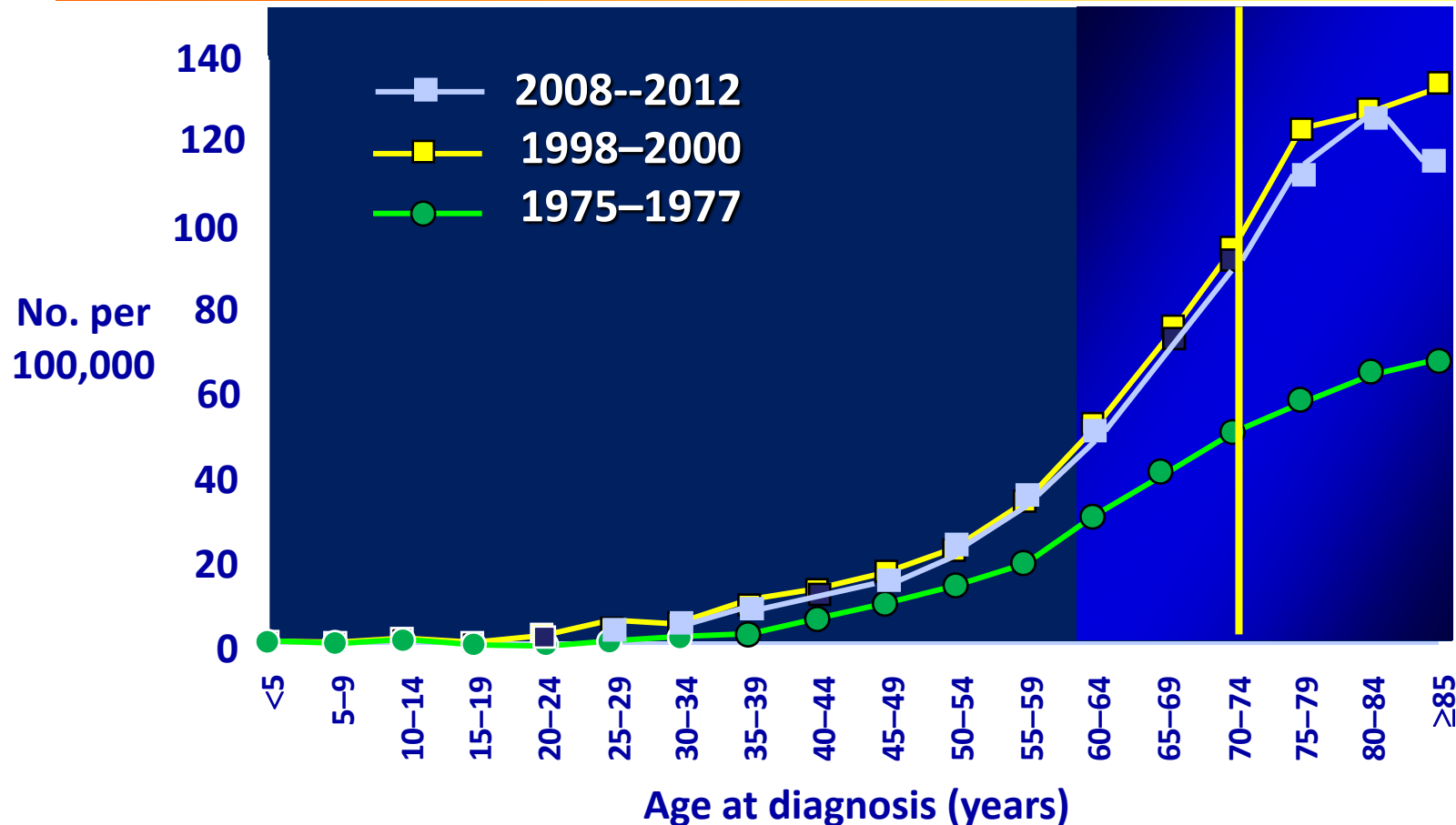
Evolution of NHL incidence



Incidence by histology over time (1975 – 2011)

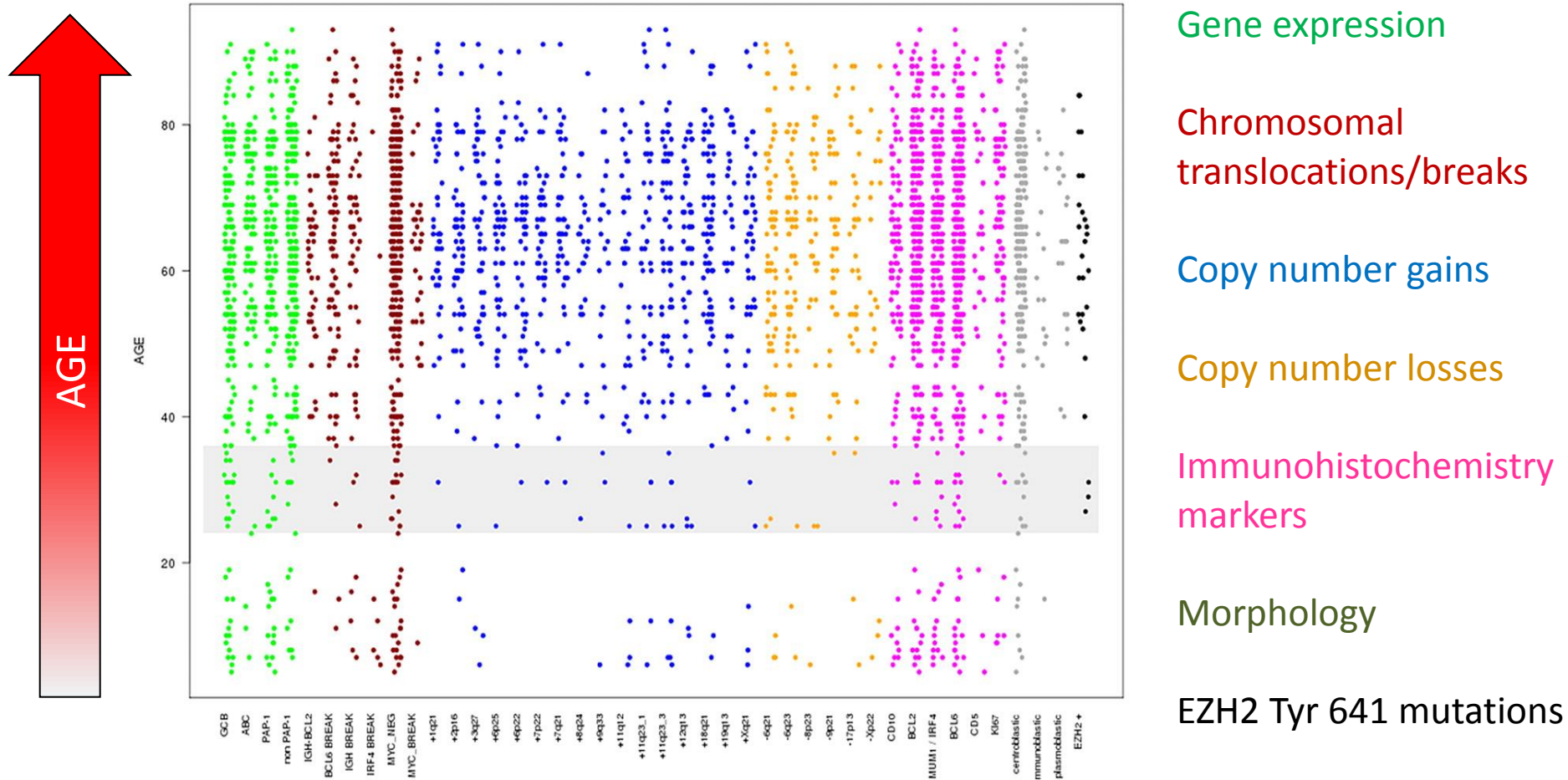


The incidence of NHL increased especially in the elderly (> 60 Years)



Ries et al (eds). SEER Cancer Statistics Review, 1975-2000
Howlader N, et. al. SEER Cancer Statistics Review, 1975-2012,

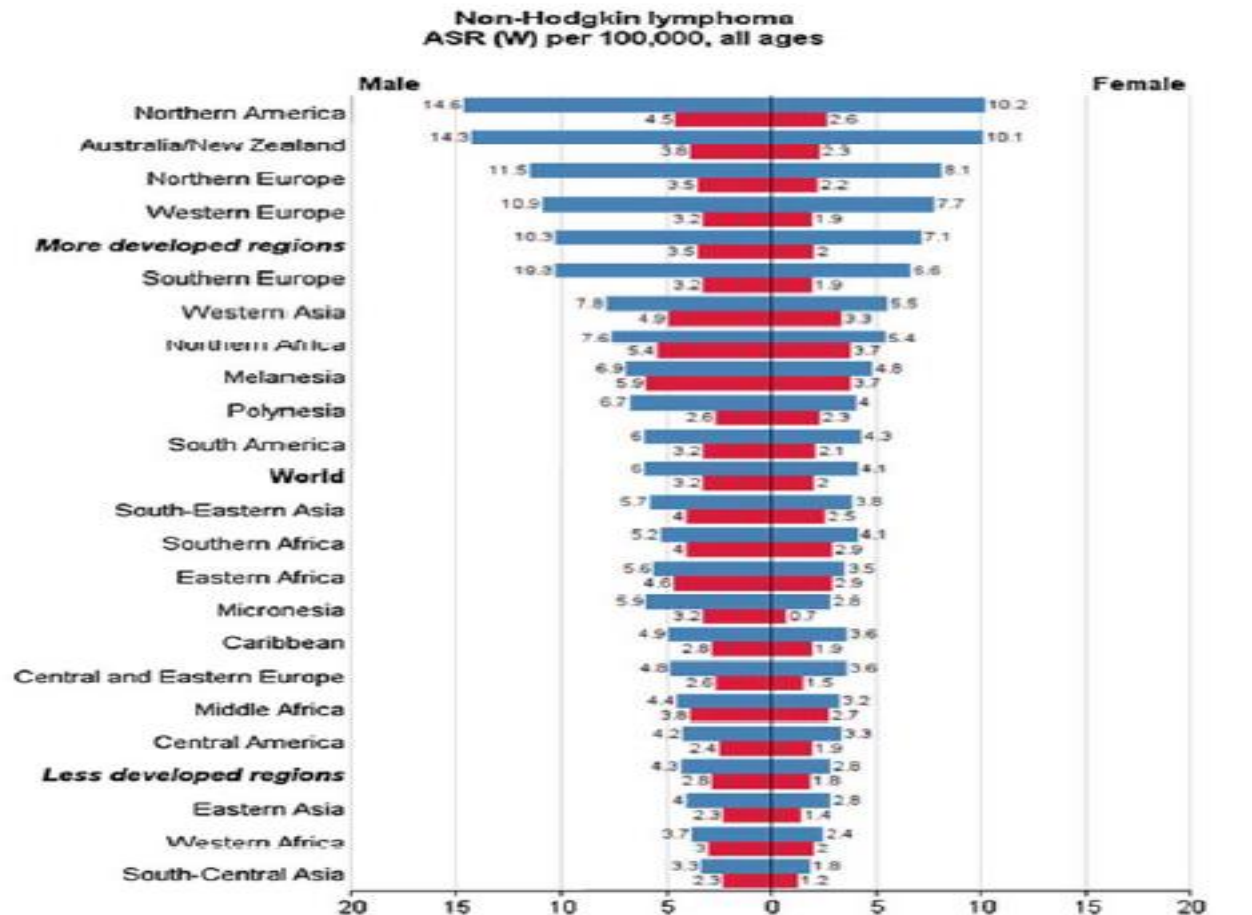
Age at diagnosis is associated with molecular complexity: n=364 pt German MMMML project



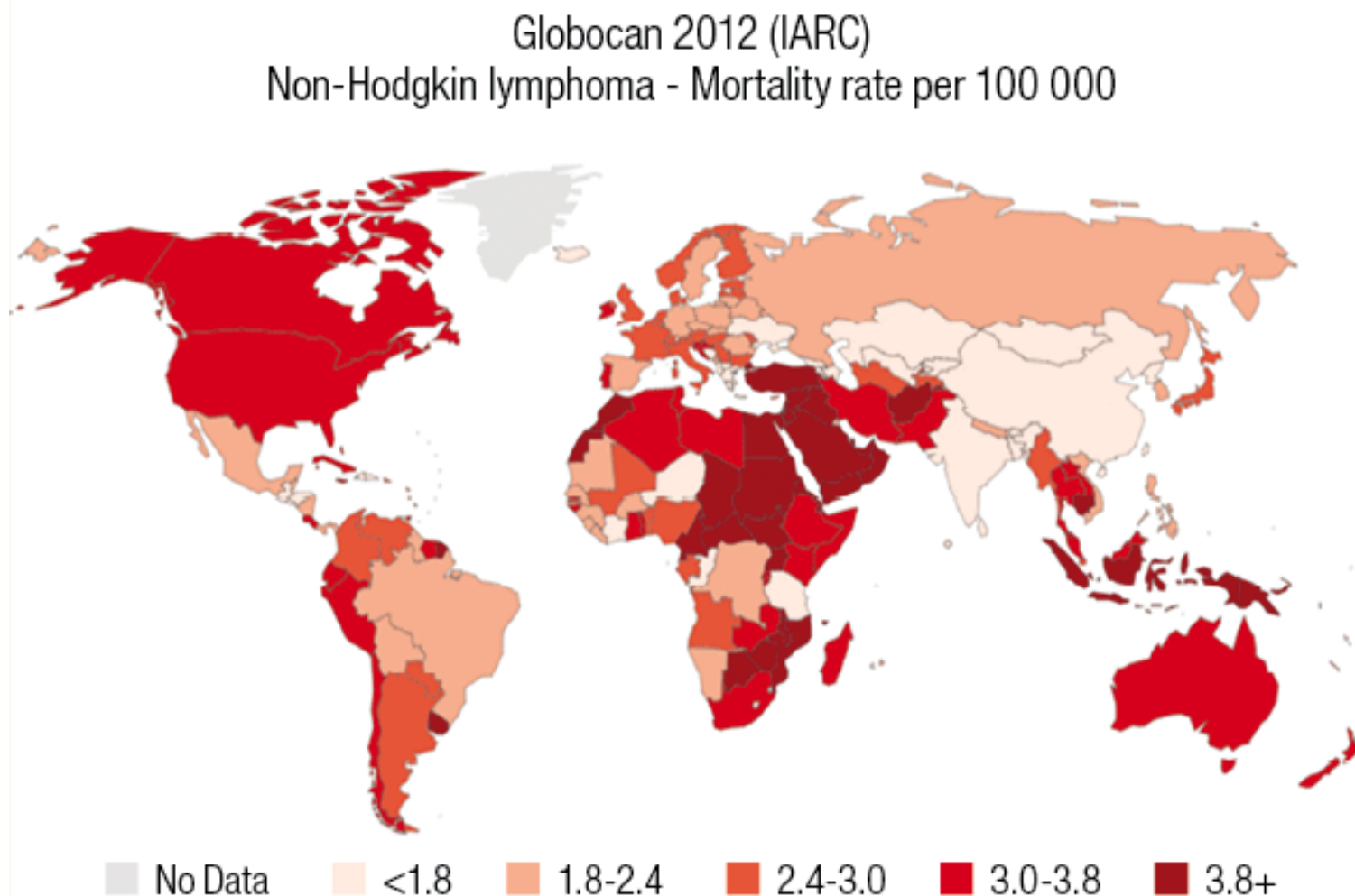
Klapper W et al. Blood 2012;119:1882-1887

Incidence of lymphoma

In the world



NHL mortality in the world



Etiology of lymphoma

- Immune modulation
- Viruses
- Bacterial infections
- Lifestyle factors
- Occupational exposures
- Host factors

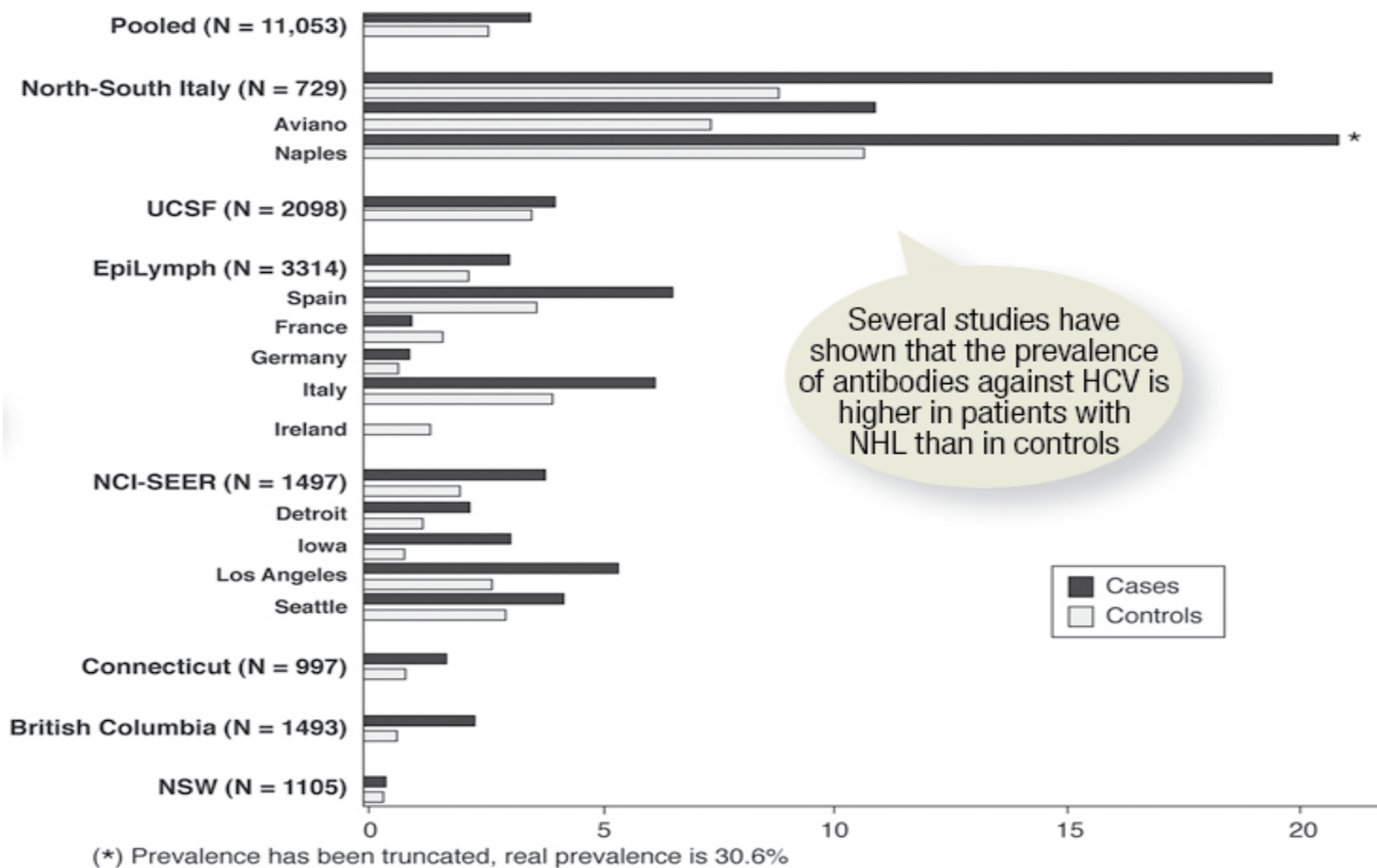
Immune modulation

- Immunosuppression is the strongest risk factor
- EBV is an important co-factor
- HIV infection increase risk x 100 (less since HAART)
(↓ immune surveillance of viruses – EBV, HHV8)
- Post-transplant immunosuppression

Viruses

Epstein-Barr Virus (EBV)	Burkitt Hodgkin NHL of immunocompromised patients
Human T-cell Lymphotropic Virus (HTLV-1)	Adult T-cell leukemia/lymphoma
Kaposi Sarcoma-associated Herpesvirus (KSHV)	Kaposi sarcoma Primary effusion lymphoma Multicentric Castelman disease Plasmablastic lymphoma
Hepatitis C Virus (HCV)	Controversial

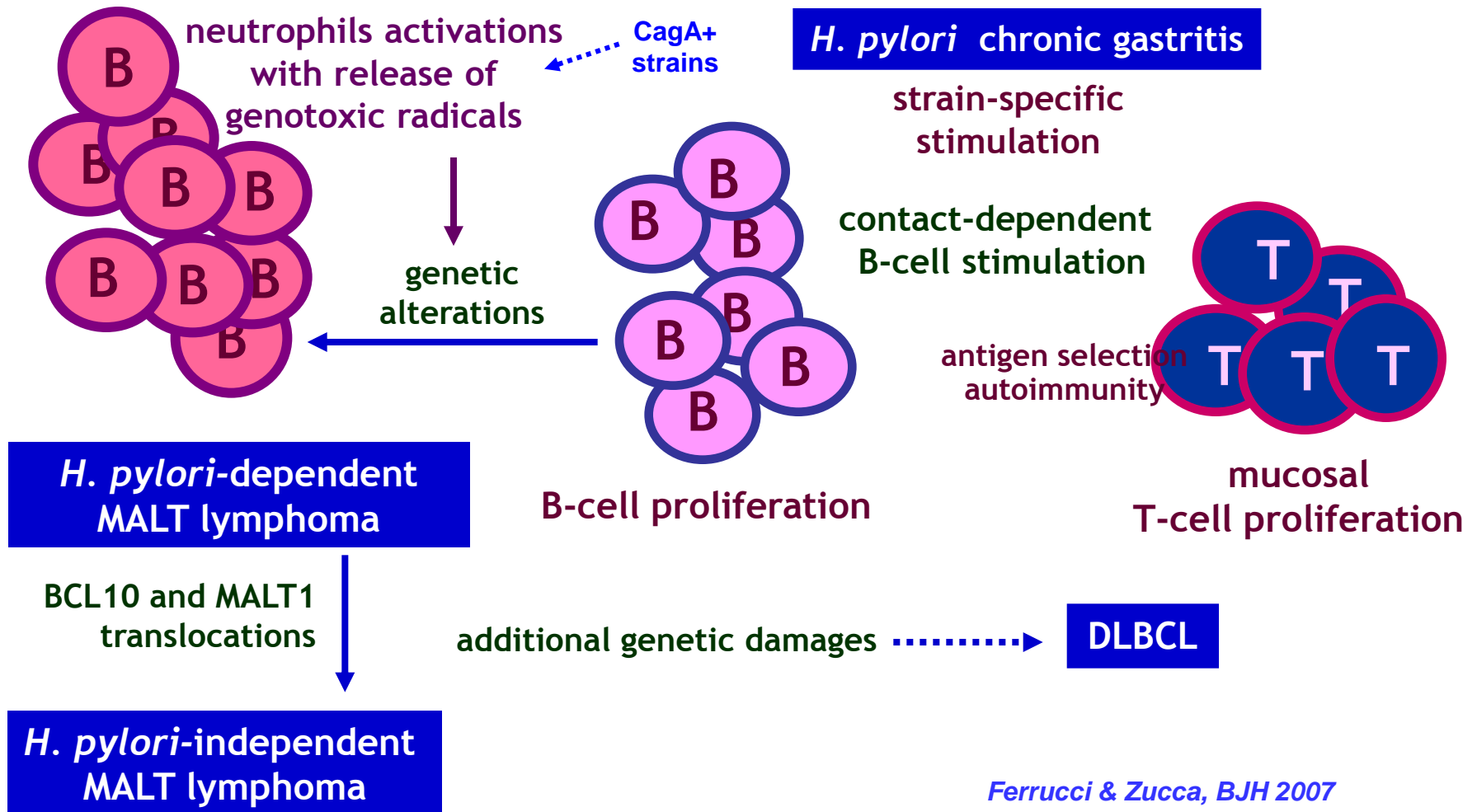
Hepatitis C could be a predisposing agent



Bacterial infections

Helicobacter pylori	Gastric MALT lymphoma
Borrelia burgdorferi	Primary cutaneous B-cell lymphoma
Chlamydia psittaci	Ocular adnexal marginal zone lymphoma

H. pylori and MALT lymphoma: a model of tumor progression



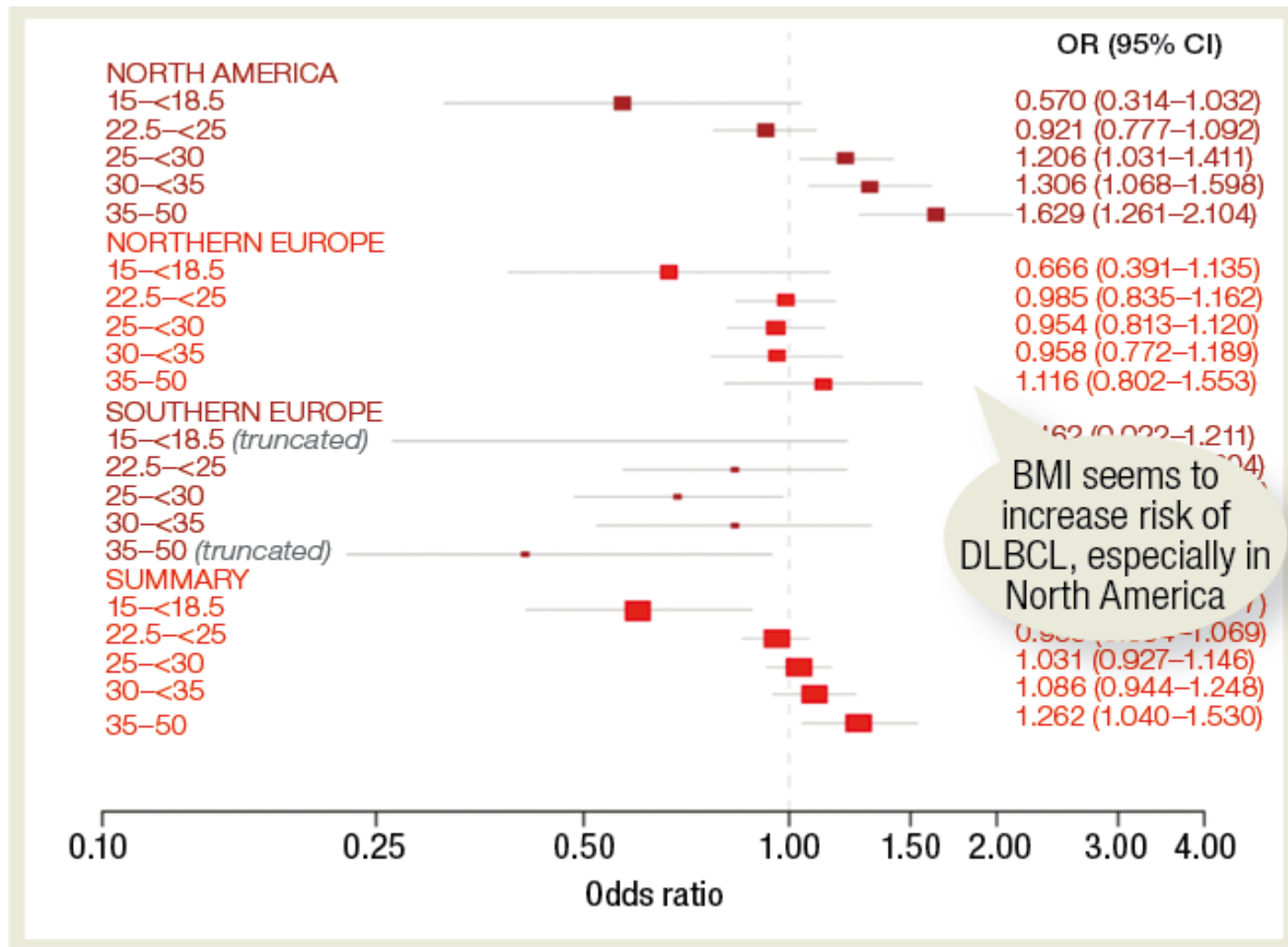
Ferrucci & Zucca, BJH 2007

Lifestyle factors



Tobacco	controversial
Alcohol use	controversial
Diet	controversial
Obesity	Possible excess of DLBCL
Hair dyes	Possible excess of FL and CLL
UV radiation	Possible protective effect

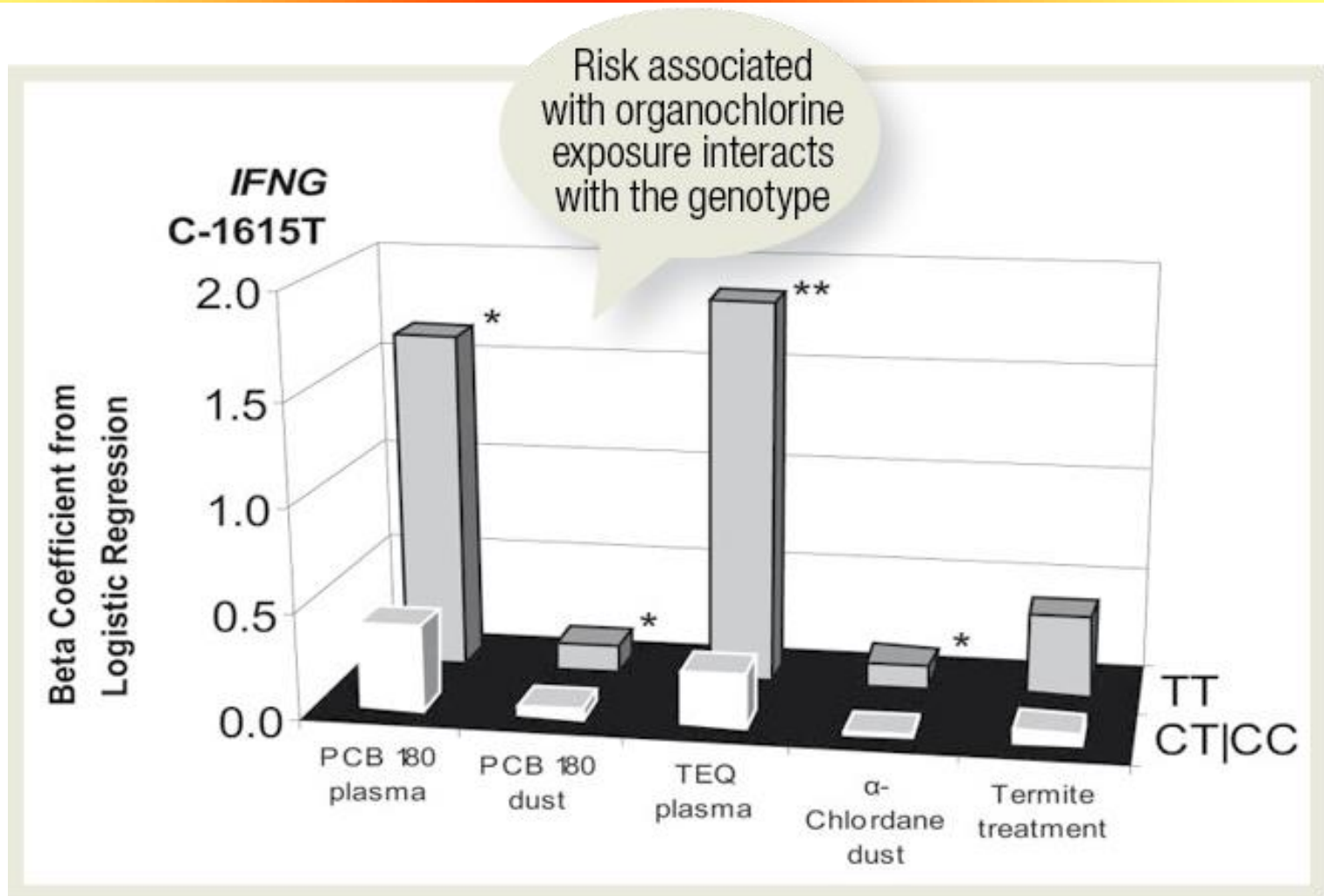
Body mass as a risk factor



Occupational exposures

Occupation	Agents
Farmers	Pesticides
Pesticide applicators	Benzene
Benzene workers	Herbicides
Petroleum refinery workers	Organic solvents
Dry cleaners	
Firefighters	
Chemists	

Some genotypes are more susceptible to carcinogens

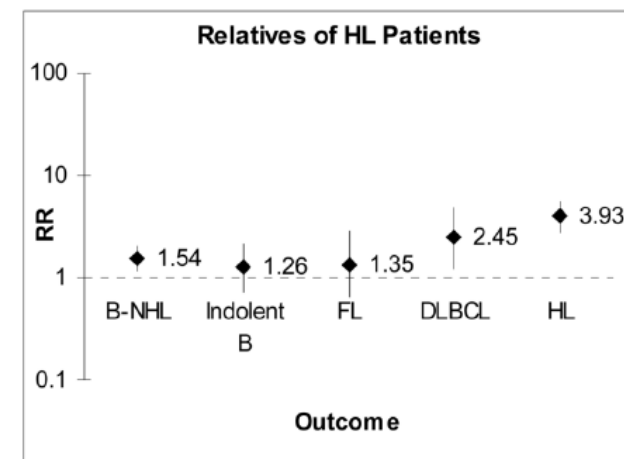
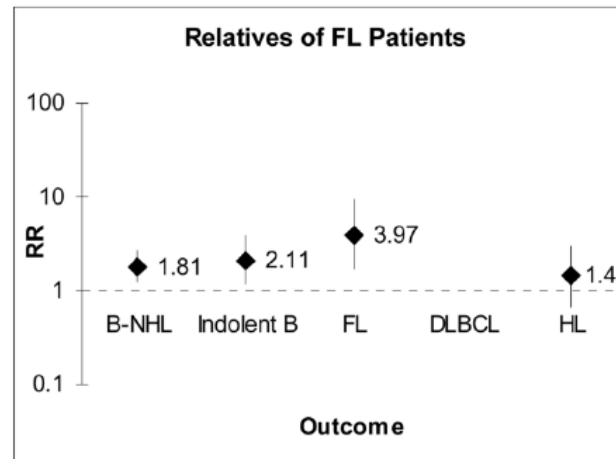
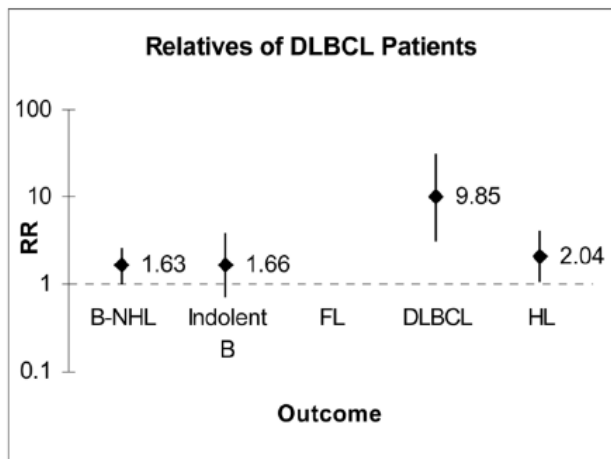


Familial aggregation

Registry study in Sweden

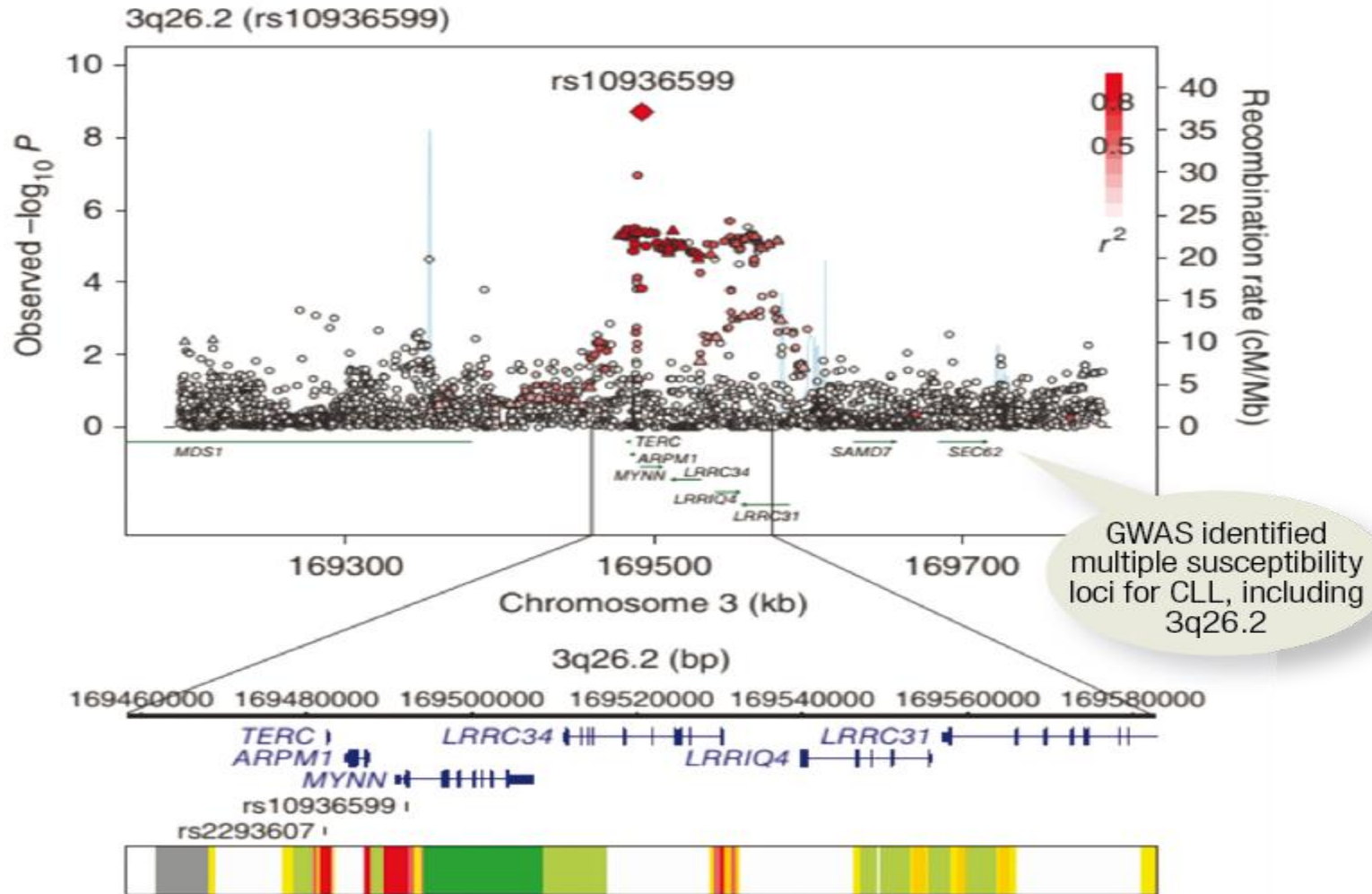
Risk of lymphoma in first degree relatives of

- 2668 FL
- 2517 DLBCL
- 6963 HL

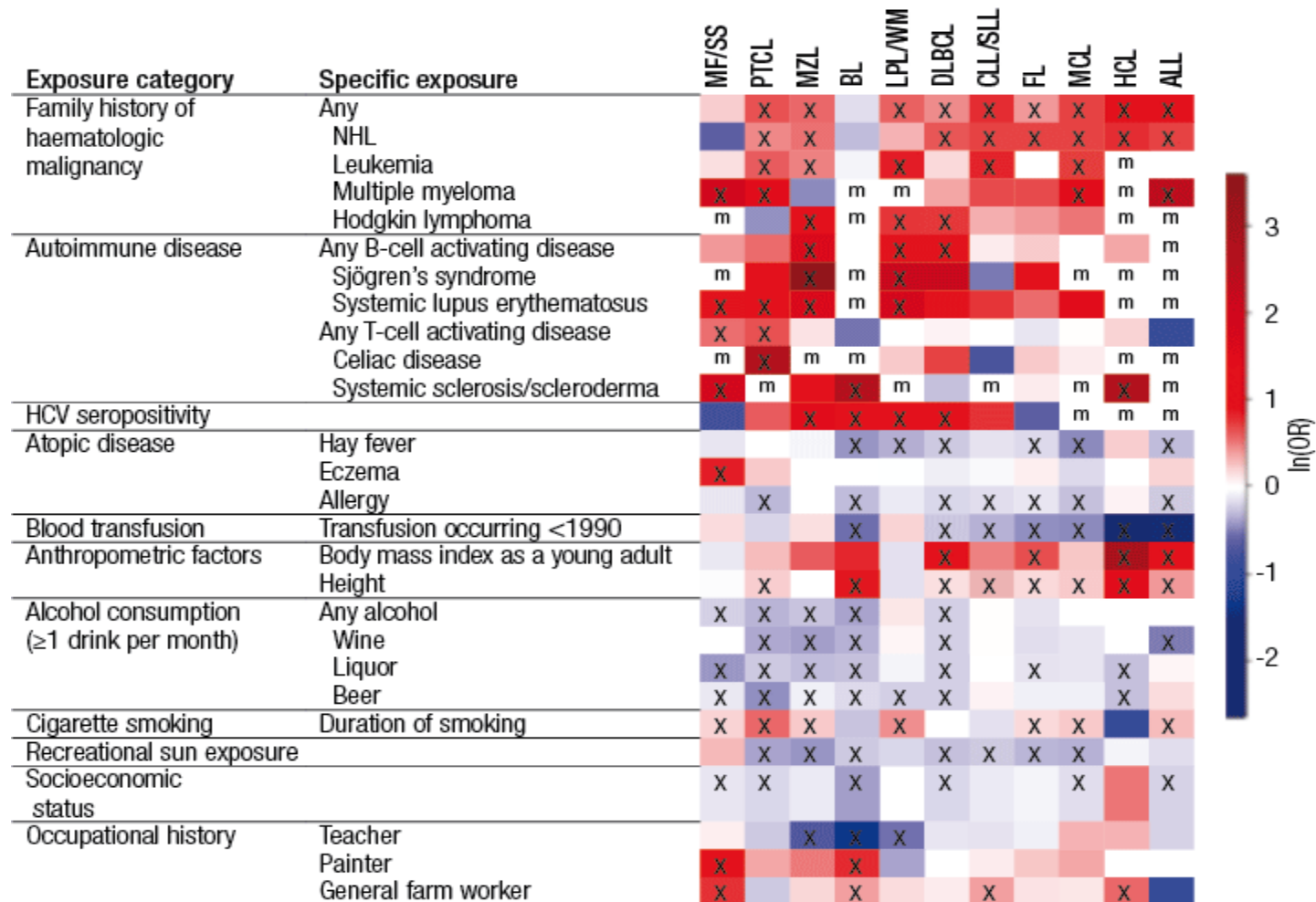


Genetic predisposition for NHL

(GWAS: genome-wide association studies)



Lymphoma inducers by histology



Conclusions

- After 20 y of increase (AIDS), incidence is now stable
- Incidence and histology differs by age and geography
- Infections, environmental and lifestyle factors matter
- Host factors have also an importance