

# Use of epidemiological studies to assess nutritional risk of vegetarian diets



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**HEALTH & SAFETY**

# Outline

**1 — Mandate and objectives**

**2 — Method and challenges**

**3 — Conclusions and next steps**

# 1 — Mandate and objectives

# Request

Update of the food-based dietary guidelines

adults (2016)

infants, children, pregnant or lactating women, older adults (2019)

**What about people following a vegetarian diet (i.e. lacto-ovo-vegetarian and vegan diets)?**

→ Working group 2019

# Working group



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# Objectives

Assess potential epidemiological associations between different types of vegetarian diets and health outcomes:

**Systematic review**

Consumption data from different types of vegetarian diets in France:



**NutriNet**

Composition data of foods consumed by vegetarians :



Inform mathematical optimization model under constraints

**Establish dietary guidelines for different types of vegetarian diets**

# 2 — Method and challenges







## Relationship between vegetarian diets and health-related outcomes

### Population

Children/adolescents, pregnant or lactating women, adults, and older adults



### Exposure

Diet excluding all or part of foods of animal origin (threshold for consumption of animal flesh: once a month or 10 g/wk)

### Comparator

Diet including animal flesh / Vegetarians excluding other food categories



### Outcomes

- Growth/weight gain
- Insulin resistance, type 2 diabetes
- Cardiovascular diseases
- Cardiometabolic risk
- Cancers
- All-cause mortality
- Bone and joint health and diseases
- Ocular diseases
- Gastrointestinal and hepatobiliary diseases
- Renal diseases
- Fertility, endocrine disruption
- Neurological disorders, etc.

### Mediating variable

- BMI

### Key definitions

**Lacto-ovo-vegetarian**: individual who does not consume animal products with the exception of eggs and their products, honey, milk and dairy products.

**Ovo-vegetarian**: individual who does not consume animal products with the exception of honey, eggs and their products.

**Lacto-vegetarian**: individual who does not consume animal products with the exception of honey, milk and dairy products.

**Vegan**: individual who does not consume animal products

### Key confounders

- **Physical activity**
- **Age**
- **Alcohol intake (adults, older adults)**
- **Income, socio-professional category, level of education**
- **Sex**
- **Smoking (active or passive)**
- Heredity (family history)
- Country of origin or ethnicity

# Type of epidemiological studies selected health outcomes (apart from mental health & nutritional status)

## Study design

**Randomized controlled trials**  
**Non-randomized controlled trials**  
**Prospective cohort studies**  
**Case-control studies**

Cross-sectional studies  
Before and after studies  
Uncontrolled trials  
Narrative reviews  
Retrospective cohort studies  
Systematic reviews  
Meta-analyses

## Countries

**Countries classified as very high on the HDI 2018**

Countries classified as high, medium or low on the HDI 2018

## Population Health status

**Healthy or at risk (overweight, family history)**

Exclusively sick

## Exposure

Studies with same definition or unknown

Studies with different definition

## Publication status

**Peer-reviewed articles**

Non-peer reviewed articles, reports, conference abstracts or proceedings

## Publication date

**No date limit**

## Size of study group

Sample size  $\geq 30$  or power calculation

Sample size  $< 30$  for observational studies

## Language

**English & French**

Not published in English or French

# Type of epidemiological studies selected for mental health & nutritional status

## Study design

<b>Randomized controlled trials</b>	Before and after studies Uncontrolled trials
<b>Non-randomized controlled trials</b>	Narrative reviews Systematic reviews
<b>Prospective cohort studies</b>	Meta-analyses
<b>Case-control studies</b>	
<b>Cross-sectional studies</b>	
<b>Retrospective cohort studies</b>	

## Countries

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## Publication date

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## Size of study group

Sample size $\geq 30$ or power calculation	Sample size $< 30$ for observational studies
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## Language

<b>English &amp; French</b>	Not published in English or French
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# Key words and screening of studies

vegetarian diet OR lacto-ovo-vegetarian OR vegan diet OR vegan diets OR Vegans OR Diet, Vegan OR Vegetarians OR Diet, Vegetarian OR Vegetarian diet OR vegetarian diets OR vegetarian OR vegetarianism OR veganism OR plant-based

PubMed.gov

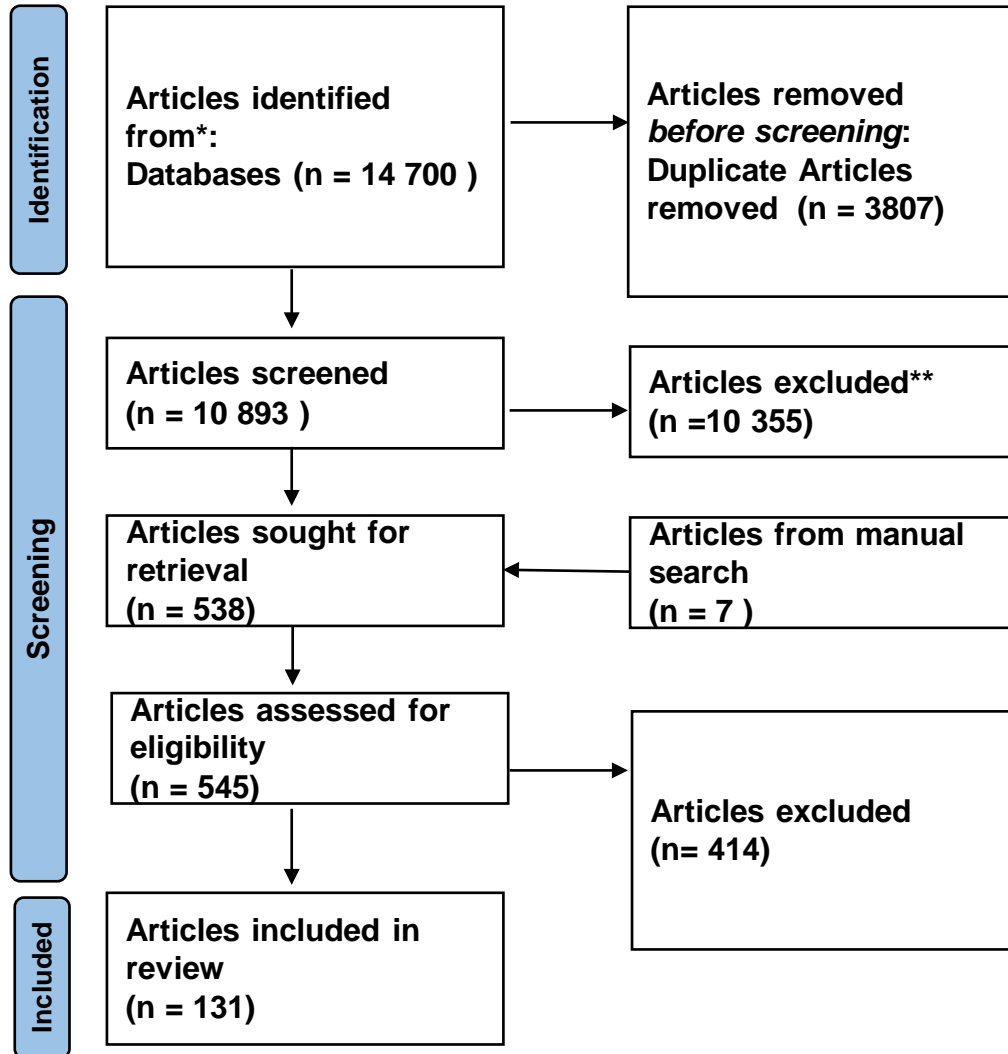


Scopus

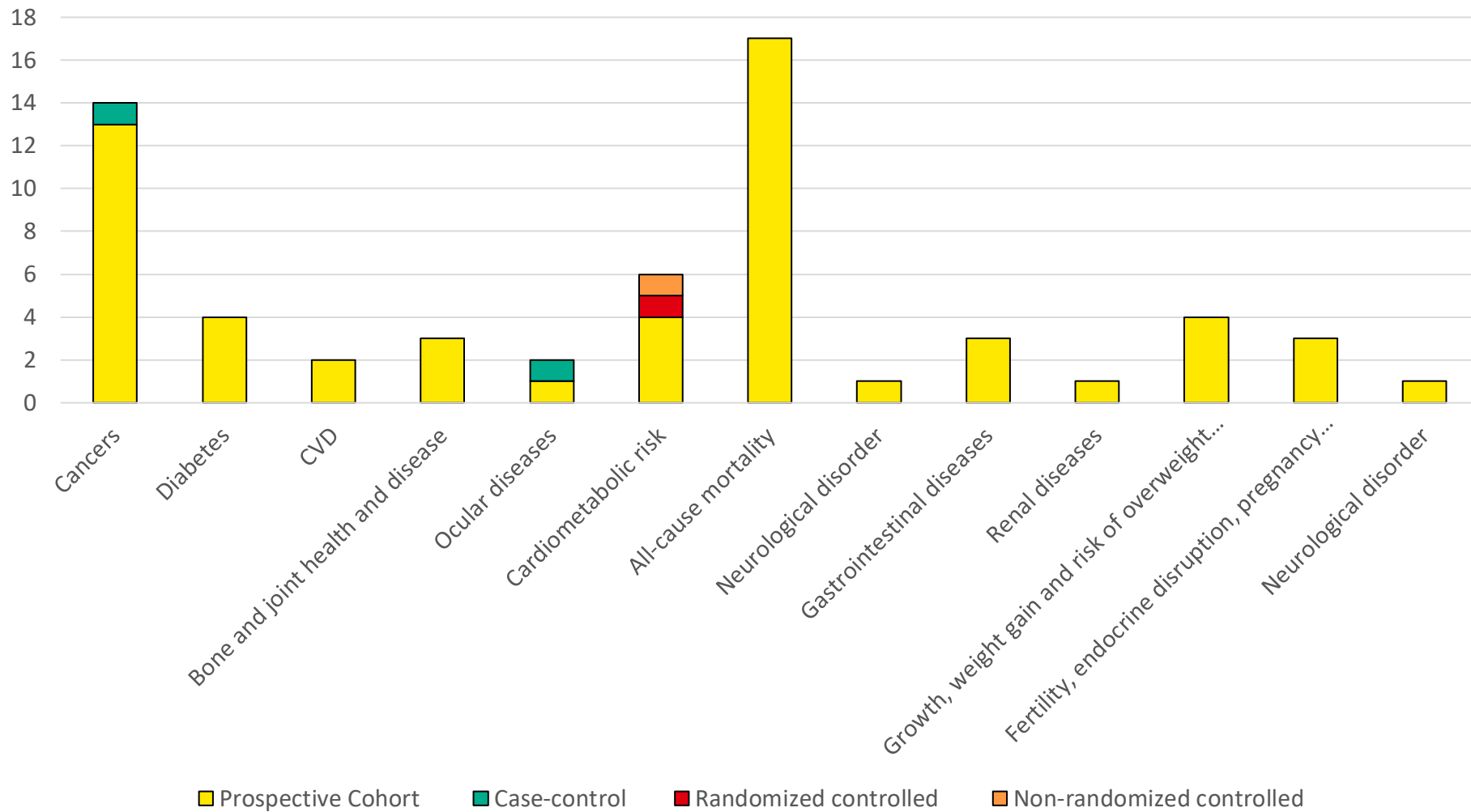
May 2019						
S	M	T	W	T	F	S
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19	20	21	22	23	24	25
26	27	28	29	30	31	

Independent and dual screening

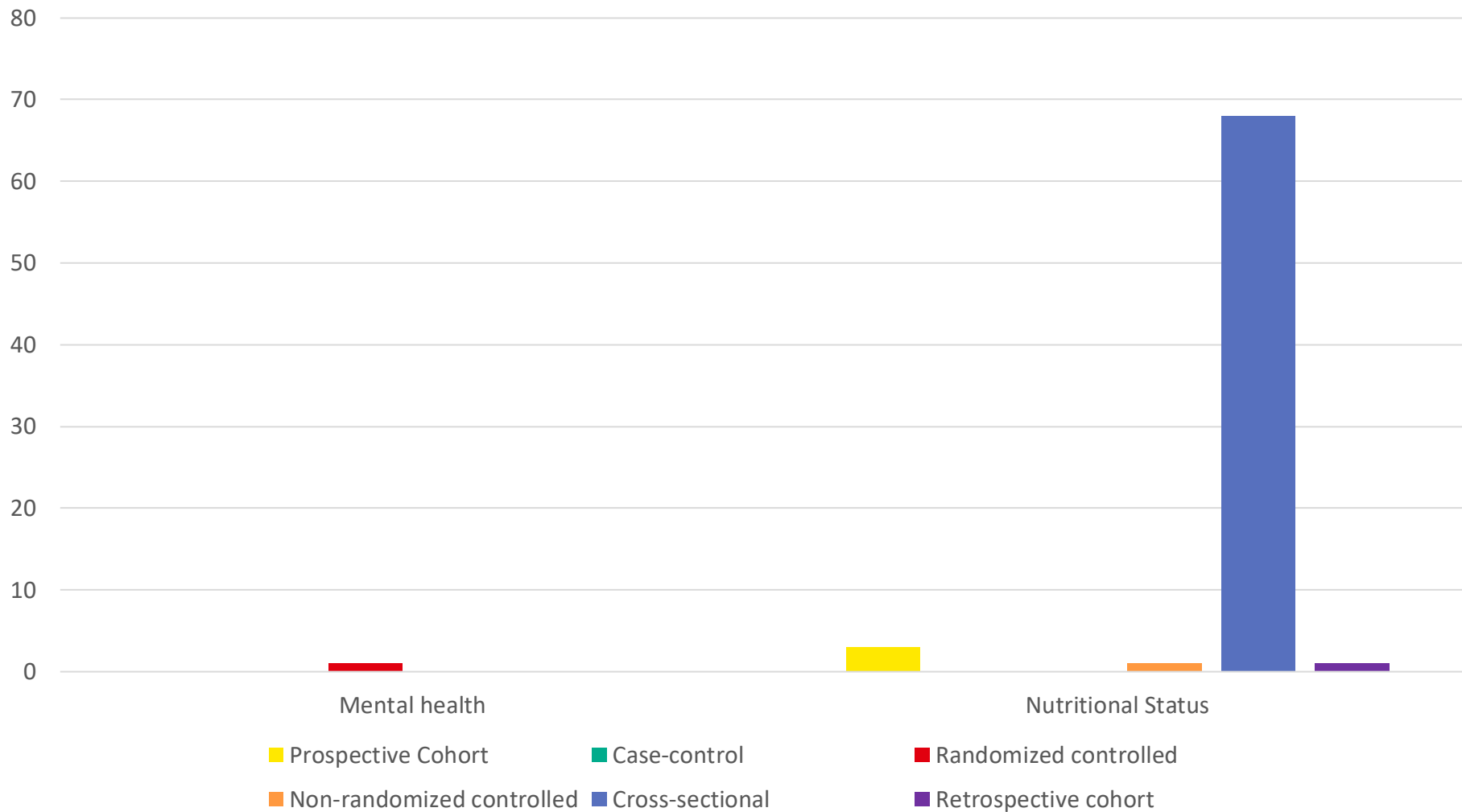
DistillerSR



## Types of study design per health outcome



## Types of study design for mental health and nutritional status



## Key data from included evidence:

- Study characteristics (design, cohort name, publication year, authors);
- Participants characteristics (size, mean/median age, etc.);
- Definition and measurement of vegetarian diet ;
- Definition and measurement of health outcome ;
- Statistical analyses ;
- Results ;
- Risk of bias assessment ;

Risk of Bias for Nutrition Observational Studies (RoB-NObs) Tool\*

RoB 2: A revised Cochrane risk-of-bias tool for randomized trials

ROBINS-I

Risk Of Bias In Non-Randomized Studies - of Interventions (ROBINS-I)

ared interests.



# RoB-NObs Tool: specific challenges

selection of participants  
always after the start of  
exposure

***Bias due to confounding***

determining key  
confounding for each health  
outcome

***Bias in selection of  
participants into the study***

some authors did not define  
vegetarian diets or were not clear  
on how they identified vegetarian  
diets

diets rarely assessed  
during follow-up

***Bias in classification of  
exposures***

***Bias due to departures  
from intended  
exposures***

several health outcomes  
based on self-declaration

***Bias due to missing  
data***

***Bias in measurement of  
outcomes***

hard to estimate as studies rarely  
submitted on [clinicaltrials.gov](https://clinicaltrials.gov)

***Bias in selection of  
reported result***

# Strength of the evidence

Identify **concordant and discordant** results and establish whether certain factors influence the relationships observed.



## ***Risk of bias***

Systematic errors assessed with ROB tools

## **Consistency**

Similarity in the direction and magnitude of effect across the body of evidence

## **Directness**

Extent to which studies are designed to directly examine the relationship between the exposures, comparators, and outcome of primary interest

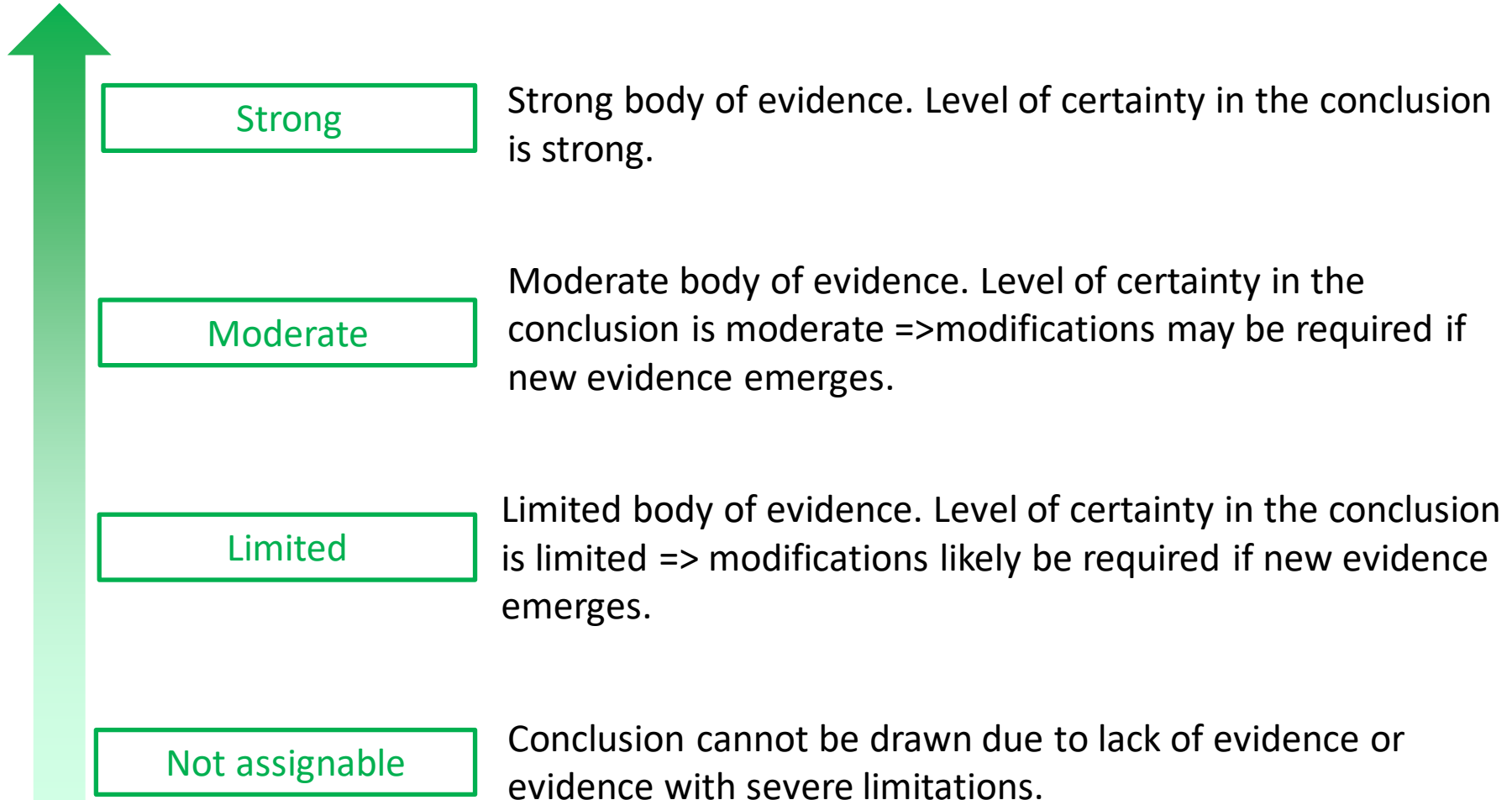
## **Precision**

Degree of certainty around an effect estimate

## **Generalizability**

Whether the study participants, exposure, comparator, and outcome(s) examined in the body of evidence are applicable to the French population

## Final grade

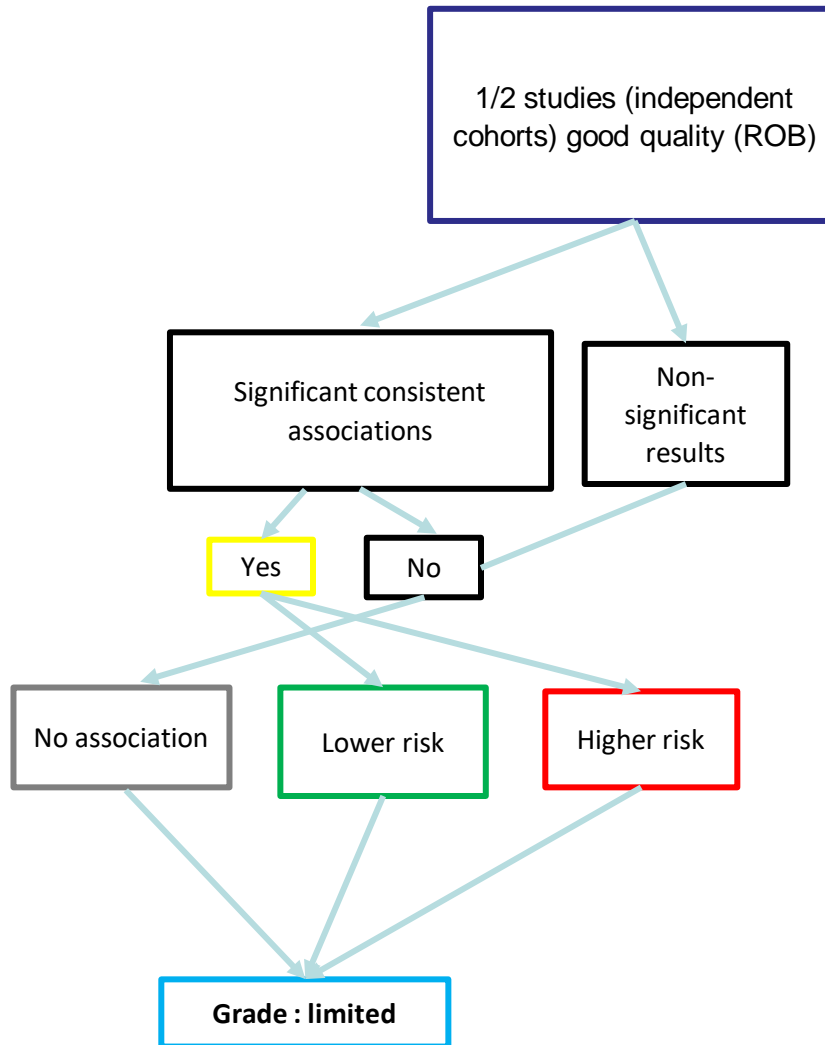


# Decision chart for awarding grade

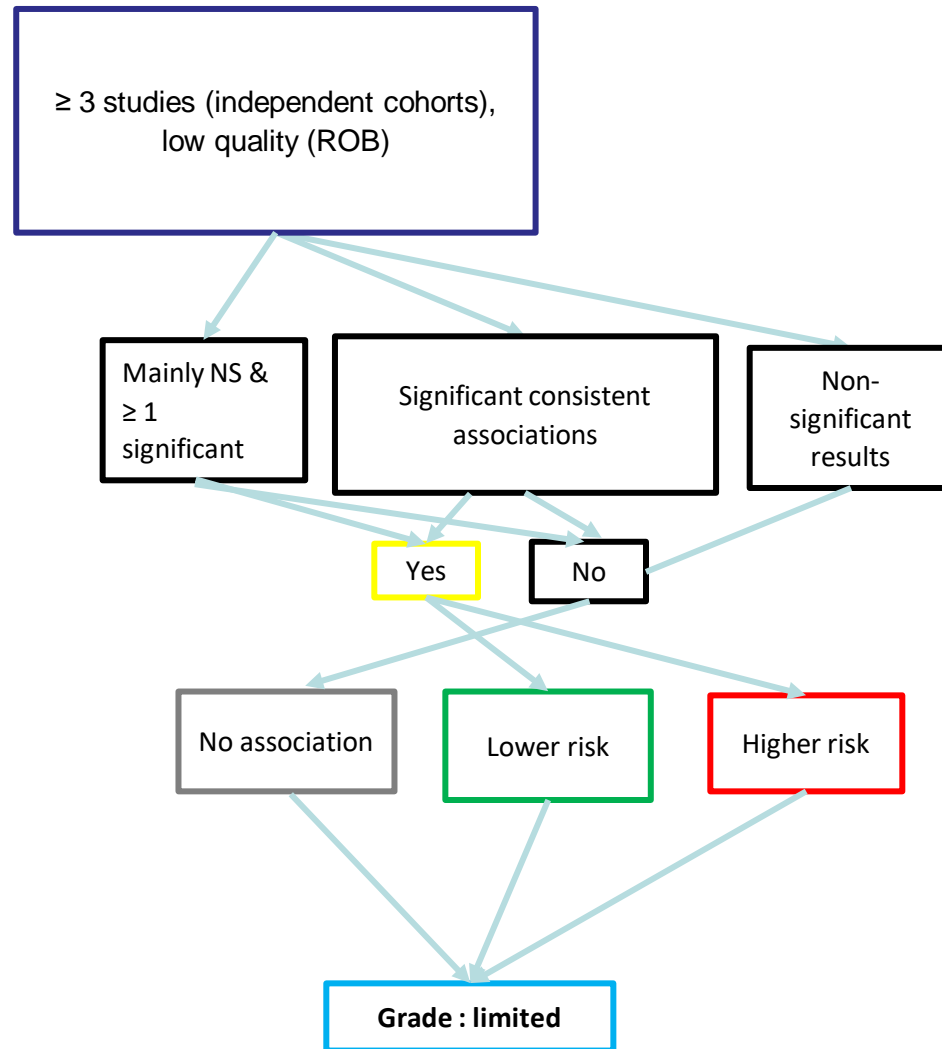
1/2 studies  
(independent  
cohorts) low quality  
(ROB)

**Grade : not assignable**

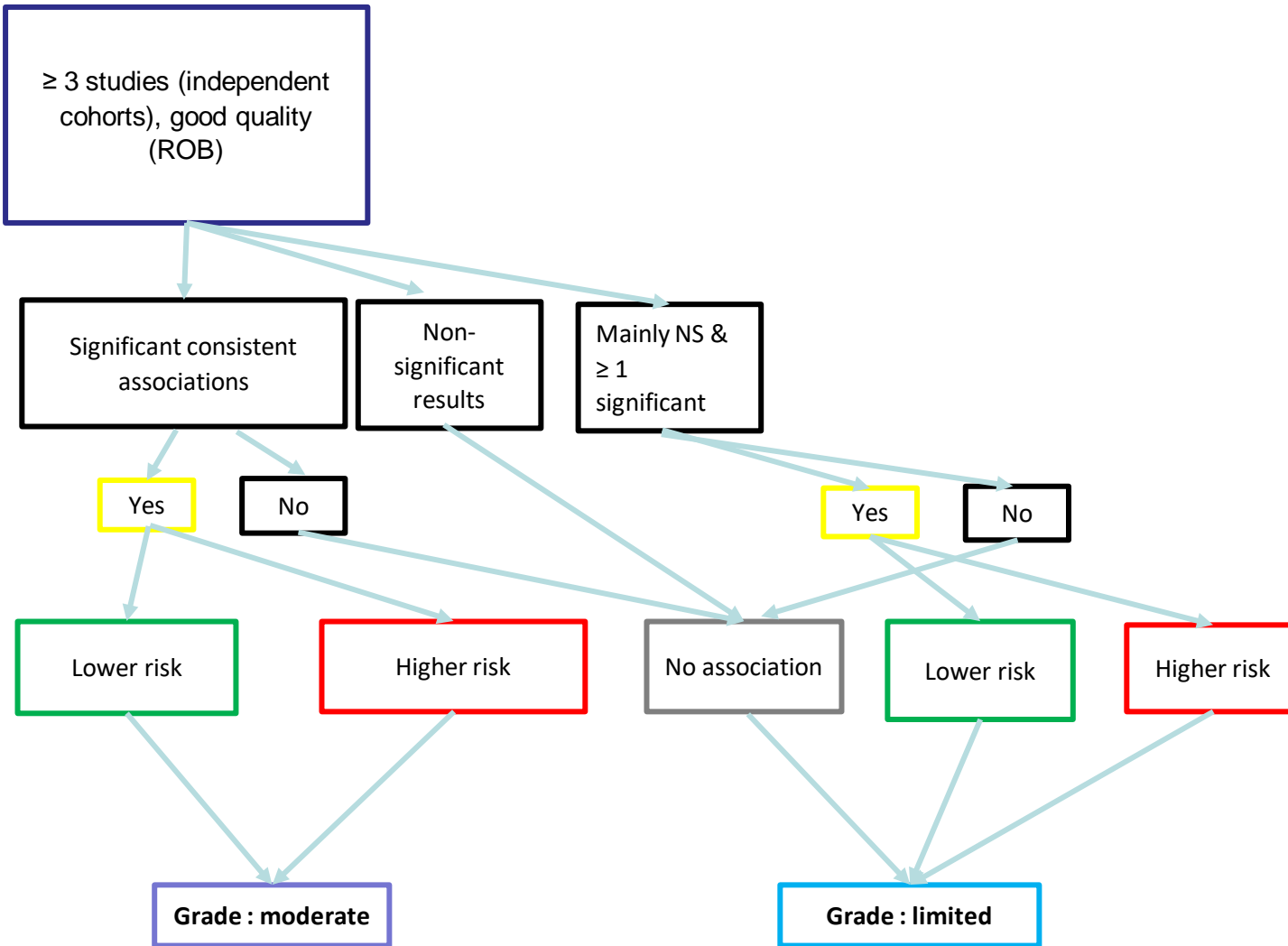
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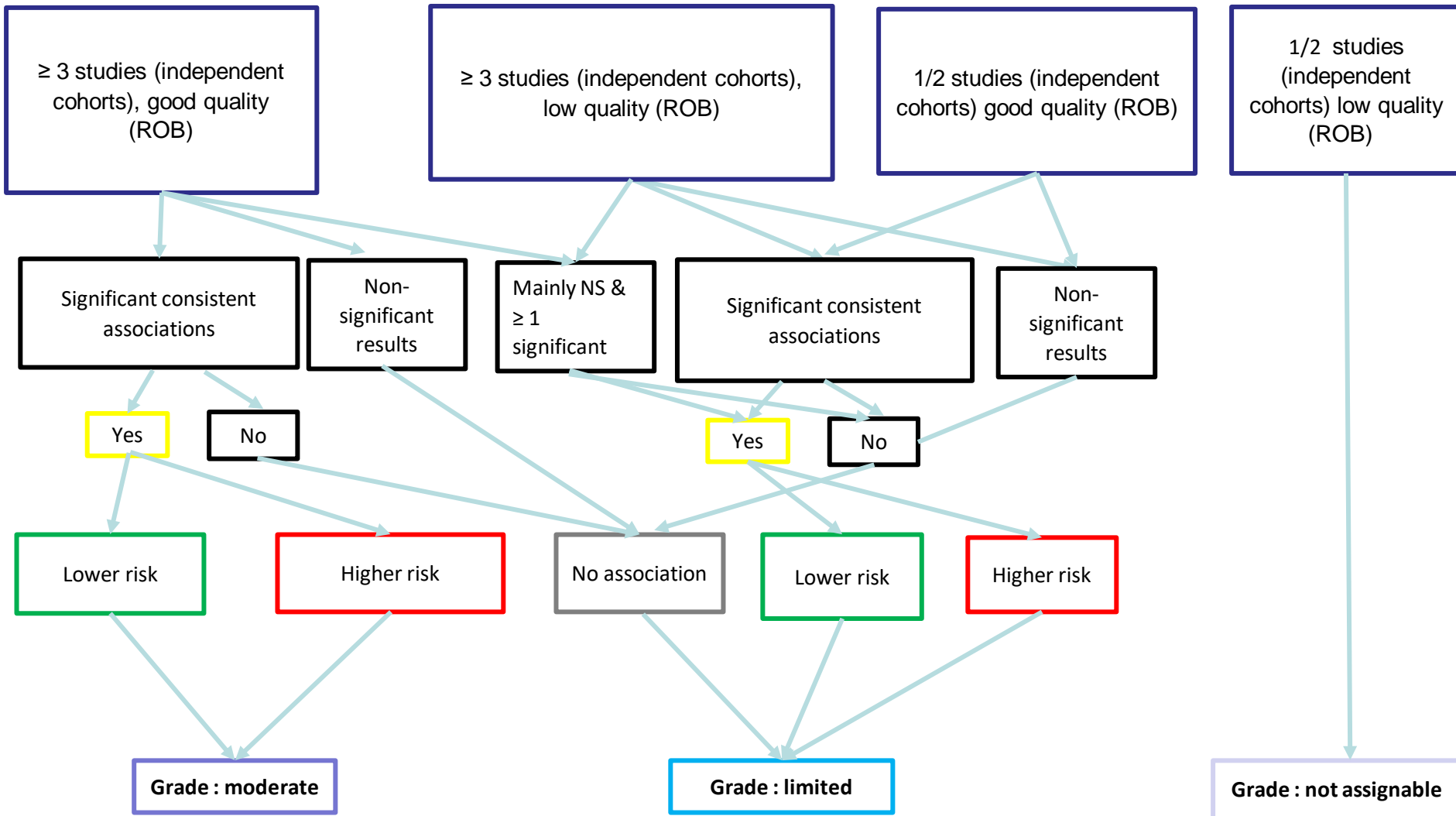
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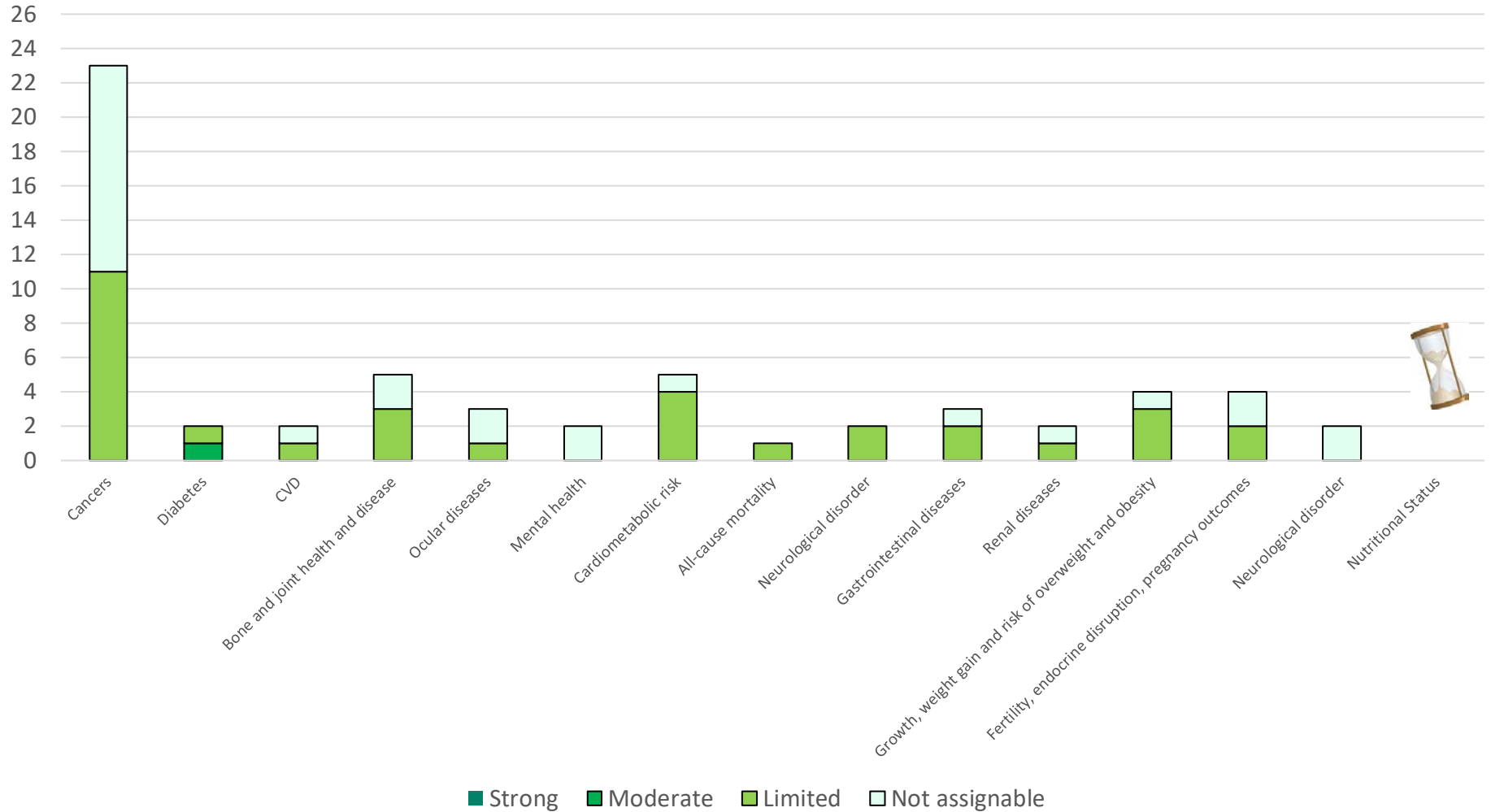




# 3-Conclusions and next steps



## Conclusions and grades



## Validation of systematic review by the Human Nutrition Expert Committee (20 members, on-going)

### Human nutrition

#### Expert Committee

The Expert Committee (CES) on "Human nutrition" is tasked with:

- assessing the nutritional and functional properties of substances and foodstuffs, as well as the associated health risks and nutritional benefits;
- developing reference intakes for the population and population subgroups;
- providing relevant scientific evidence (opinions, scientific and technical support, recommendations) for the development and implementation of national and EU nutrition policy;
- assessing the nutritional risks of regulated products, such as foods intended for special medical purposes or novel foods or ingredients;
- operational monitoring of the nutriviigilance scheme under the French Act on Regional Health Governance (HPST Act) of July 2009.

Inclusion of epidemiological, consumption, nutritional and contamination data in optimisation tool to establish food-based dietary guidelines.



OptiAlim<sub>v0.6</sub>



Notice d'utilisation

Sélectionnez une base de données

Sélectionnez une base de données

Lancer les calculs

# Questions?

