





# Consequences on measuring adequacy and sustainability in Social Security after pandemic

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# About the authors



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*Brief bio*



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*Brief bio*

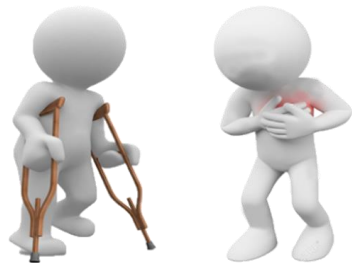
- **Inail** – National Institute for Insurance against Accidents at Work



# Agenda



- Sustainability and Adequacy
- Indicators of Adequacy
- What is **INAIL** ?
- A Case Study on the Adequacy of Italian Disabled Workers' benefits

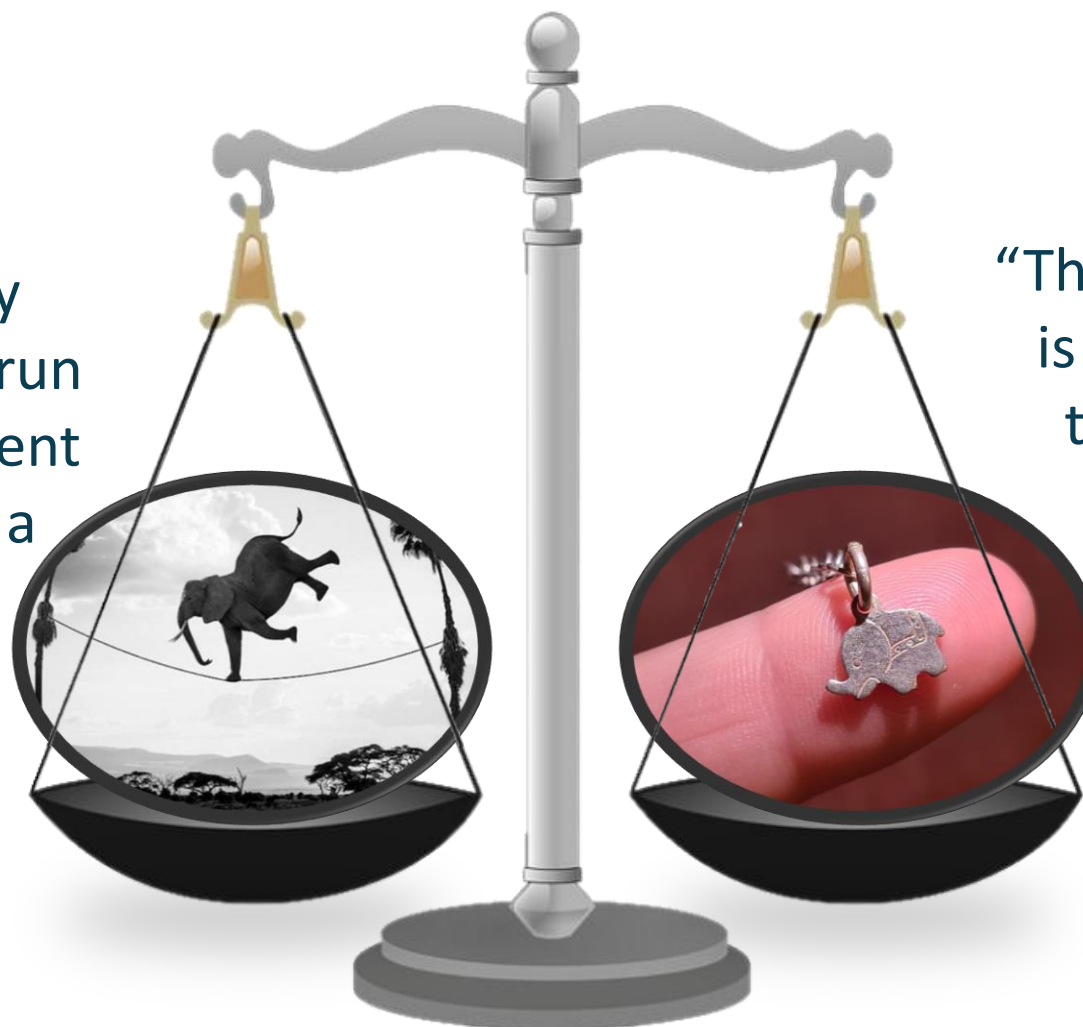


# Sustainability and Adequacy



IMF, 2022

“The **SUSTAINABILITY** of a public pension system may be defined as if it will not run into prolonged or permanent financing constraints over a long horizon”



European Parliament

EP, 2015

“The **ADEQUACY** of pensions is measured by their ability to prevent poverty and by the degree to which they match the level of pre-retirement income”

# Indicators of Adequacy



## Theoretical Replacement Rate

$$TRR = \frac{P_{spa}}{W_{spa-1}}$$

$TRR$  = *Theoretical Replacement Rate*;

$spa$  = *standard pensionable age*;

$P_{spa}$  = *annual Pension amount in the first year of retirement (at age  $spa$ )*;

$W_{spa-1}$  = *pre-retirement annual Wage (at age  $spa-1$ )*

**How many PreRetirement Annual WAGES you can purchase  
with your Annual PENSION**

# Indicators of Adequacy



## Pension Wealth

$$PW = \frac{\sum_{k=1}^{\omega} v^k p_{spa,k} P_{spa+k}}{W_{spa-1}}$$

*GROSS PW*  
*NET PW*

$PW$  = **Pension Wealth**;

$spa$  = **standard pensionable age**;

$v$  = **discount factor**;

$p_{spa,k}$  = **Probability** that an individual who retired at  $spa$  will survive  $k$  years;

$P_{spa+k}$  = **annual Pension** of an individual who retired at age  $spa$  surviving after  $k$  years;

$W_{spa-1}$  = **pre-retirement annual Wage** (at age  $spa-1$ )

**How many PreRetirement Annual WAGES you can purchase  
with the present value of your Life PENSION**

# INAIL

## A CASE STUDY ON THE DISABLED PENSION WEALTH



## MISSING IN ACTUARIAL LITERATURE

I.N.A.I.L.



1933

Istituto  
Nazionale per  
l'Assicurazione contro gli  
Infortuni sul  
Lavoro



National  
Institute for  
Insurance against  
Accidents at  
Work

I.N.A.I.L.

2024



# INAIL

## OBJECT OF THE COVERAGE

### ACCIDENTS AT WORK

The accidents due to a violent cause during work



### OCCUPATIONAL DISEASES

All work related illness contracted at work over time

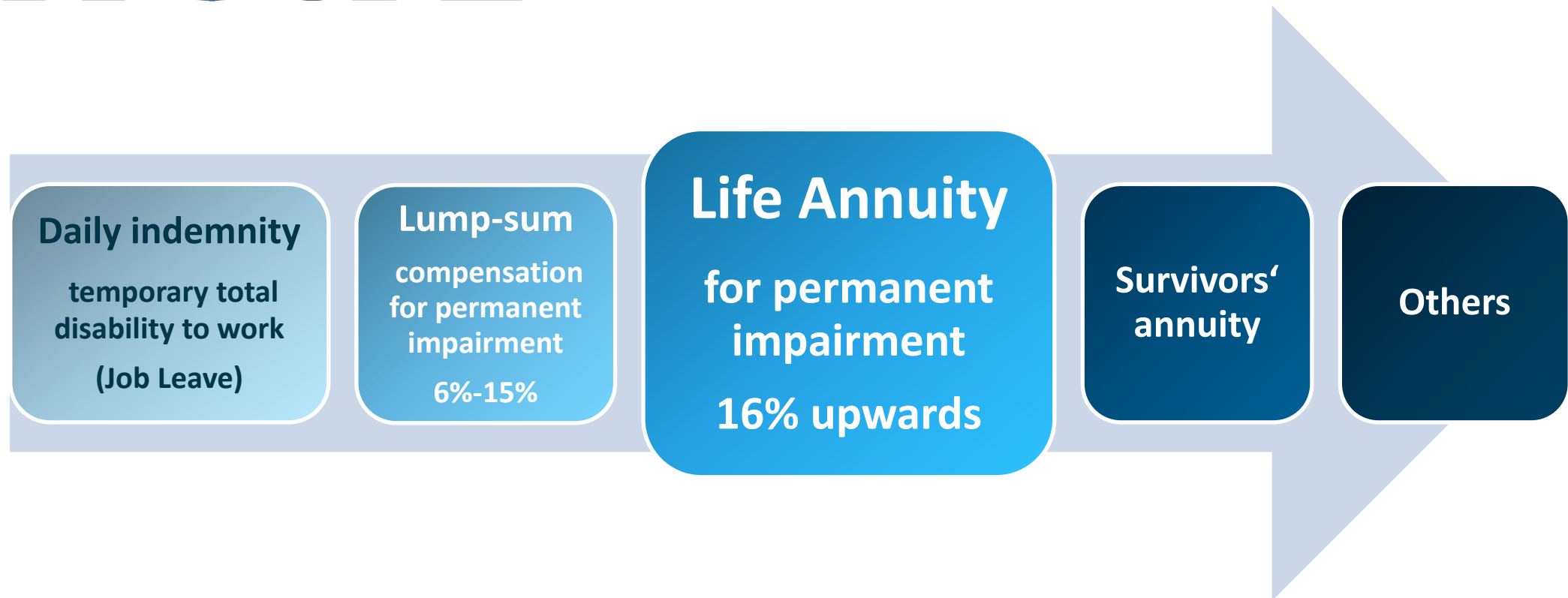


I.N.A.I.L.



# INAIL



## ECONOMIC BENEFITS



# A Case Study on the Adequacy of Italian Disabled's benefits



## Distribution of annuitants by classes of impairment

Type of Event		Classes of impairment degree	
		16% - 60%	61% - 100%
Accident		59.1%	1.8%
Occupational Disease		38.8%	0.3%

# Indicators of Adequacy



## Disabled Pension Wealth

$$DPW = \frac{\sum_{k=0}^{\omega} v^k p_{spa,k} (P_{spa+k} + DB_{spa+k})}{W_{spa-1} + DB_{spa-1}}$$

*GROSS DPW*  
*NET DPW*

*DPW* = **Disabled Pension Wealth**

*Same as before plus:*

$DB_{spa+k}$  = annual **Disability Benefit** of a disabled worker who retired at age *spa* surviving after *k* years;

$DB_{spa-1}$  = pre-retirement annual **Disability Benefit** (at age *spa-1*)

**How many PreRetirement Annual EARNINGS you can purchase with the present value of your global Life “DISABLED INCOME”**

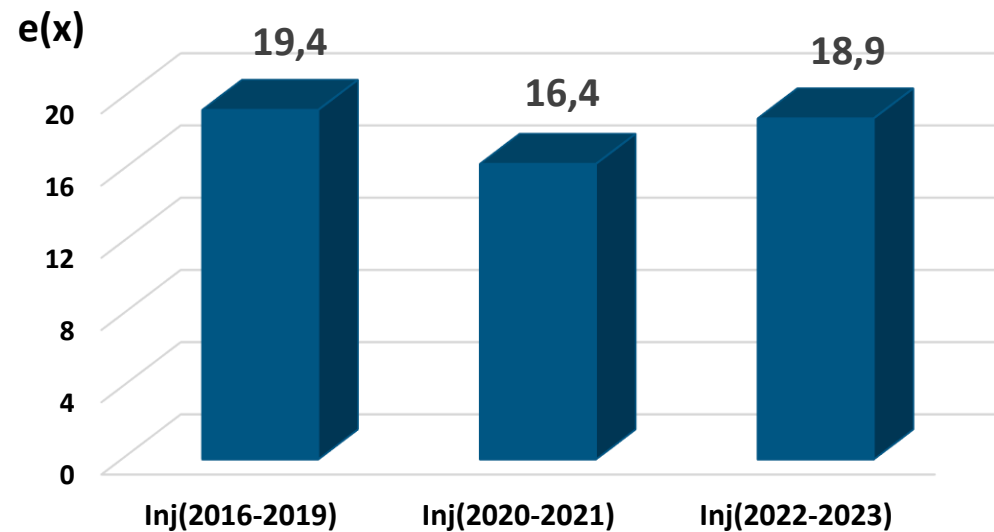
# A Case Study on the Adequacy of Italian Disabled's benefits



## Injured Workers' Life Expectancy at age 67



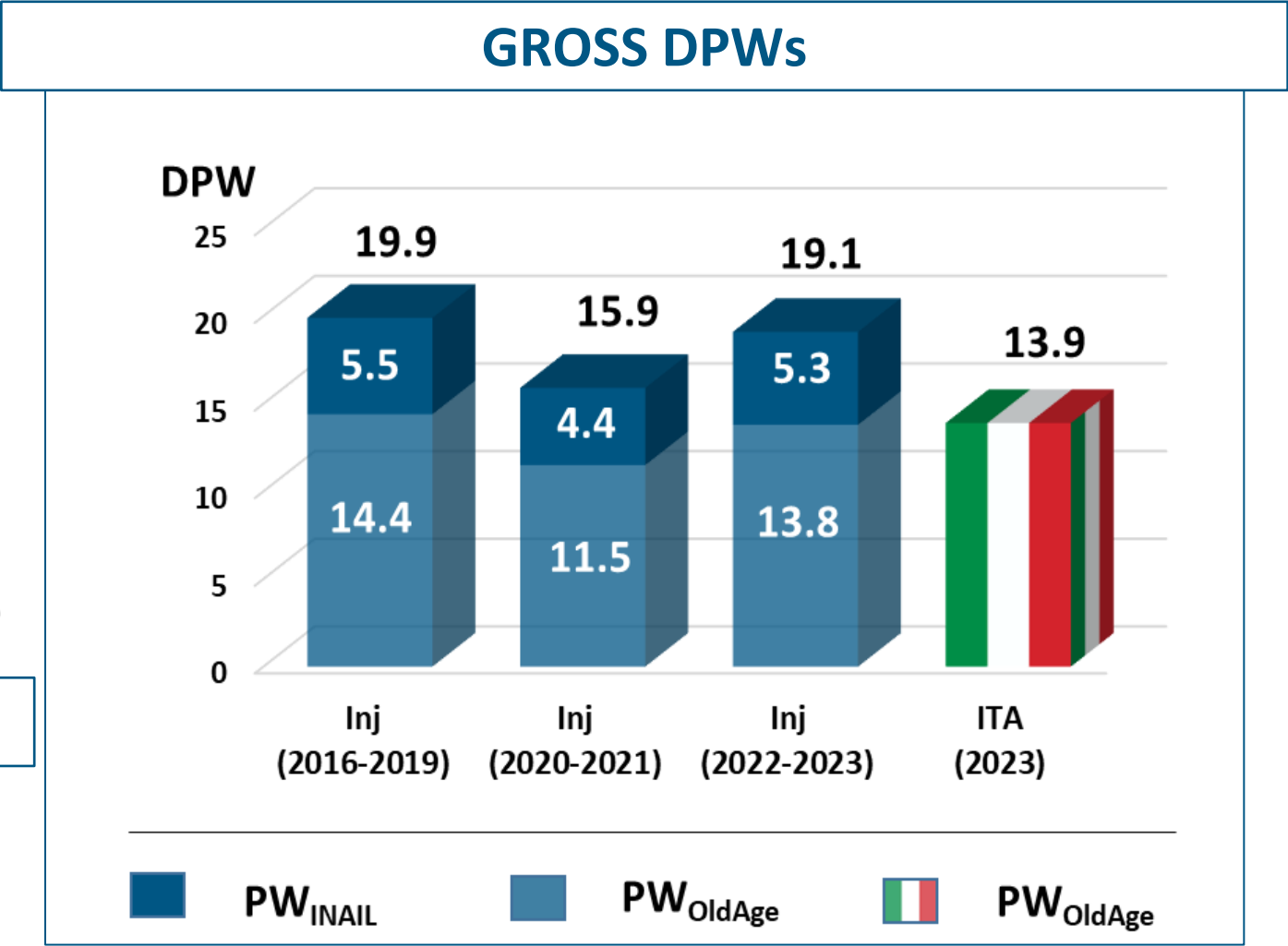
16%-60%



# A Case Study on the Adequacy of Italian Disabled's benefits



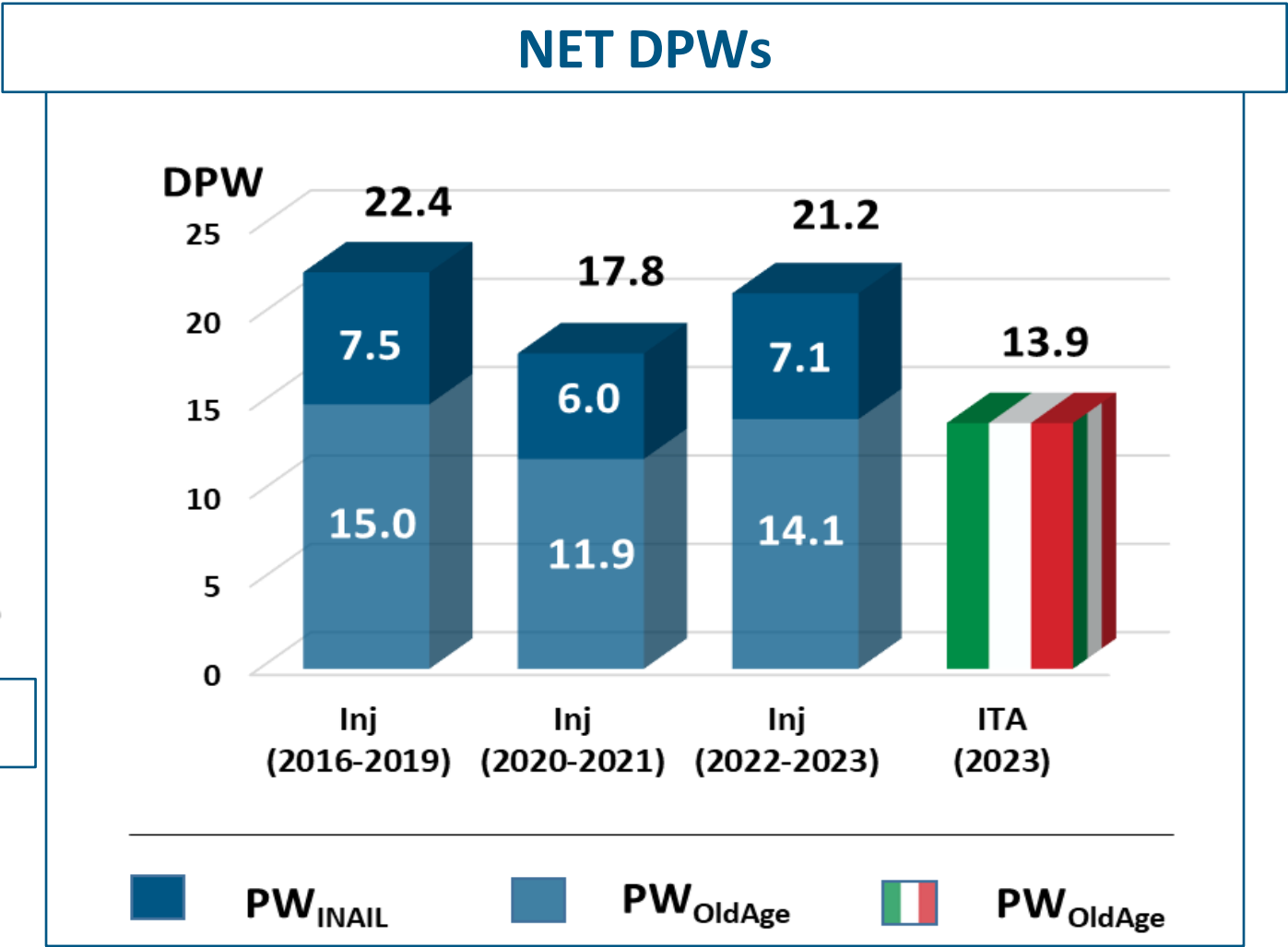
16%-60%



# A Case Study on the Adequacy of Italian Disabled's benefits



16%-60%



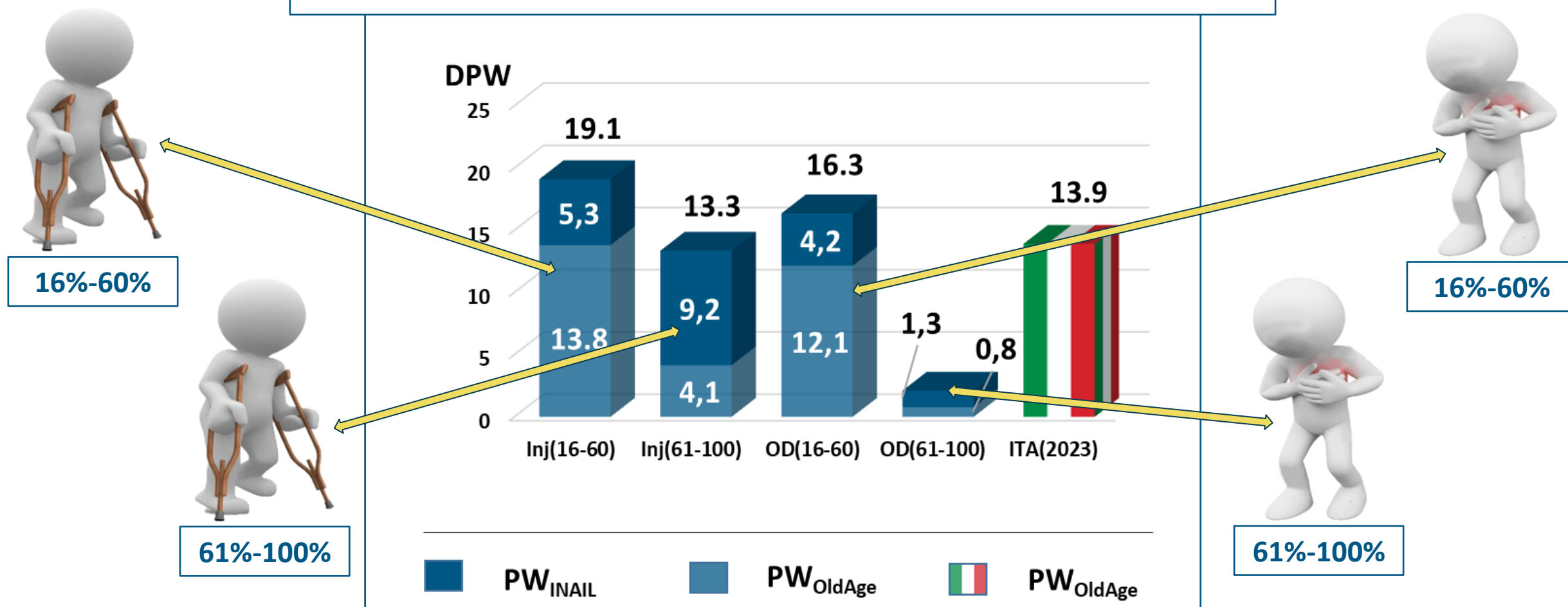
$$DPW = \frac{\sum_k vp (P + DB)}{W_{spa-1} DB_{spa-1}}$$

Gross DPW and Net DPW 16% - 60% Average Variations		
DPW <sub>WorkProt</sub>	DPW <sub>OldAge</sub>	DPW
35%	3%	38%

# A Case Study on the Adequacy of Italian Disabled's benefits

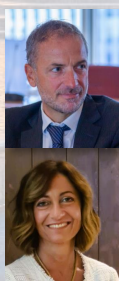


Gross DPWs by Type of Disability and Classes of Impairment ( $e_x$  2022-2023)



# Thank you

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