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Vaccination coverage and determinants of under-immunization in immunocompromised children

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Overview

- **Background**
- Methods
- Results
- Discussion
- Conclusion

Background

Immunocompromised children: increased risk for infectious diseases

Recommendations

Vaccination	8 wk	12 wk	16 wk	12 m	15 m	6 y	10 y	12 y	14 y
Poliomyelitis	↑	↑	↑		↑	↑			
Diphteria									↑
Tetanus									
Pertussis									
Haemophilus influenza B									
Hepatitis B									
Pneumococcus (10-valent)	↑		↑	↑	↑				
Rota	~~↑~~	~~↑~~	~~↑~~						
Measels				✗			✗		
Mumps									
Rubella									
Meningococcus type C					↑				
HPV(♀)								↑↑↑	

+ Annual influenza vaccination

Background

How well protected?

Herd immunity

Vaccination coverage lower in those who are often ill

Lower vaccination coverage in different patient populations

(% and 95% CI)	Allergy N = 86	Congenital heart disease N= 118	Diabetes mellitus N = 126	Cystic fibrosis N = 52	Total N = 382	Flemish children
DTaP-IPV-Hib-HBV	75.6% (64.9 – 83.9)	57.6 (48.2 – 66.6)	55.6 (46.5 – 64.3)	61.5 (47.0 – 74.4)	61.5 (56.4 – 66.4)	93.0
PCV	84.8 (67.3 – 94.3)	83.7 (68.7 – 92.7)	93.8 (67.7 – 99.7)	71.4 (47.7 – 87.8)	83.2 (74.7 – 89.3)	94.9
Rota	76.7 (57.3 – 89.4)	71.1 (53.9 – 84.0)	83.3 (50.9 – 97.1)	61.1 (36.1 – 81.7)	72.4 (62.3 – 80.8)	89.7
MMR	80.8 (60.0 – 92.7)	61.2 (46.2 – 74.5)	84.0 (73.8 – 90.8)	73.7 (48.6 – 89.9)	76.0 (68.9 – 82.0)	96.2
MenC	87.3 (77.5 – 93.4)	80.2 (70.6 – 87.4)	84.8 (75.4 – 91.1)	82.9 (67.4 – 92.3)	83.8 (79.1 – 87.6)	93.7
Booster DTaP-IPV	94.2 (83.1 – 98.5)	80.0 (68.9 – 88.0)	84.4 (75.7 – 90.3)	74.2 (58.5 – 89.7)	83.8 (79.1 – 88.3)	87.4
HPV ♀	33.3 (1.8 – 87.5)	73.7 (48.6 – 89.9)	76.9 (55.9 – 90.2)	42.9 (11.8 – 79.8)	69.1 (55.0 – 80.5)	89.5

Aim

- **Vaccination coverage**
- **Determinants** for potential incomplete vaccination

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Monocentric, retrospective study

Immunocompromised children
Age: 2 -18 years
Dutch speakers
Living in Flanders

1. Vaccination dates
2. Socio-demographic data
3. Socio-economic data
4. Determinants of vaccination

Additional data collection: vaccination coverage

- Vaccinnet
- General practitioners

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Completeness of vaccination schedule

n = 184

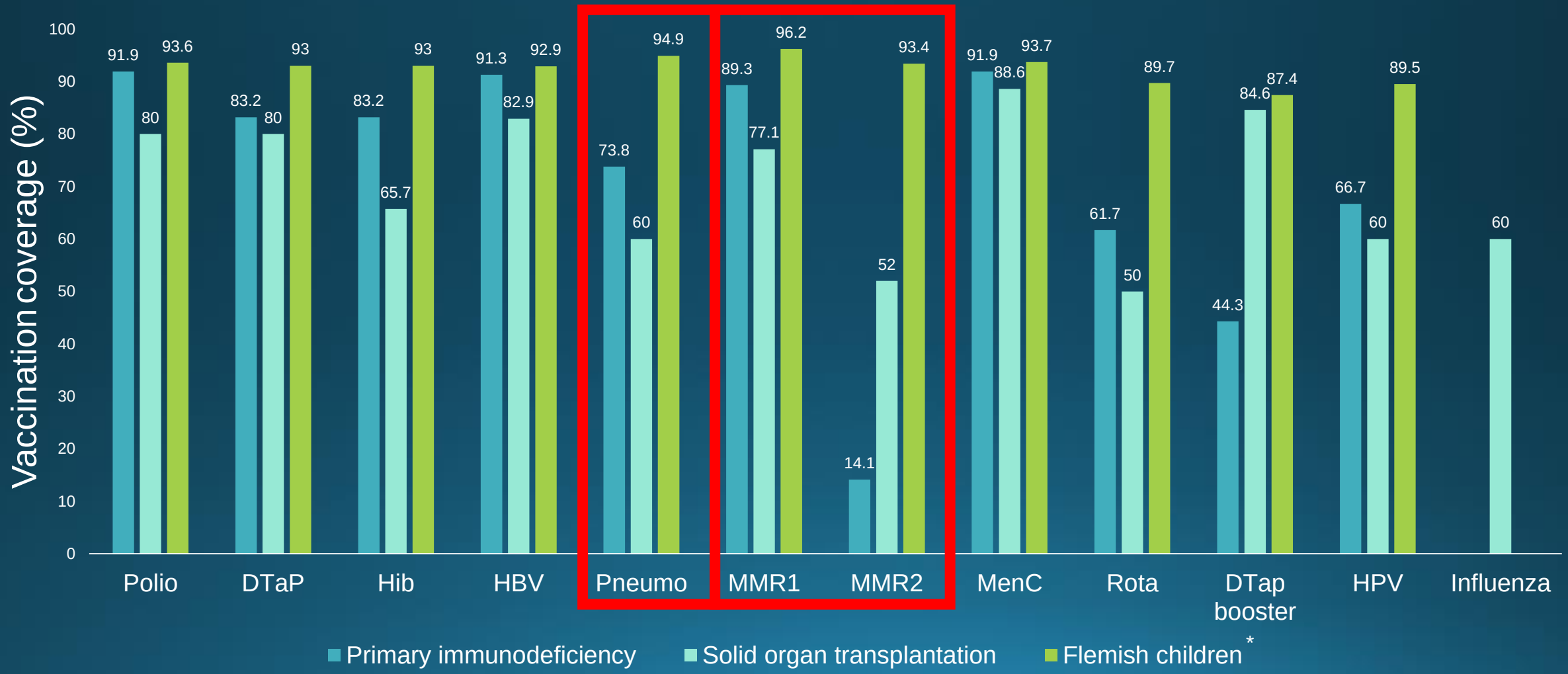
Solid organ transplant (SOT)
N=35
Pretransplant: n = 7
Postransplant: n =28

Completed vaccination shedule: **51,4%**

Primary immunodeficiencies (PID)
N=149

Completed vaccination schedule : **61,1%**

Vaccination coverage



*Studie van de vaccinatiegraad in Vlaanderen 2016

Determinants of vaccination in PID-patients

- **Vaccination by paediatrician vs well-baby clinic**
  - **Hexa: 65,5% vs 83,5%; OR: 0,38**
  - **PCV: 60,0% vs 97,5%; OR: 0,04**
  - **MMR: 68,8% vs 96,9%; OR: 0,1**
- **Vaccination by GP vs well-baby clinic**
  - **Hexa: 30,0% vs 83,5%; OR: 0,1**
  - **PCV: 28,6% vs 97,5%; OR: 0,01**
  - **MMR: 80,0% vs 97,5%; OR: 0,1**
- **One-parent family**
  - **PCV: 55,6% vs 86,8%; OR: 0,2**
- **Unemployed mother**
  - **Men C: 78,8% vs 95,7%; OR: 0,2**
- **Higher family income**
  - **PCV: 91,3% vs 75,6%; OR: 3,4**
  - **MMR: 78,8% vs 92,2%; OR: 0,3**

Determinants of vaccination in SOT-patients

- **Vaccination by well-baby clinic**
  - **Hep A: 63,0% vs 12,5%; OR: 11,9**
- **Follow-up at well-baby clinic**
  - **Basic vaccine schedule: 80,0% vs 40%; OR: 6,0**
- **Employed mother**
  - **Basic vaccine schedule: 70,0% vs 6,42%; OR: 6,0**
  - **PCV: 75,0% vs 40,0%; OR: 4,5**
- **>2 children in a family**
  - **PCV: 25,0% vs 70,4%; OR: 0,14**

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Discussion

Immunocompromised children: more likely to have missed vaccinations

Scattered follow-up of immunization by different vaccinators
School doctor, GP and specialist

Monitor the vaccination state in these children more strictly
Register in Vaccinnet
Clear communication to the patient

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Conclusion

Vaccination rates were **lower** in immunocompromised children

MMR vaccination was often contra-indicated

Vaccination coverage was associated with:

1. > 2 children in a family
2. One-parent family
3. Unemployment of the mother

1. Vaccination in well-baby clinics