



Travel and the immunocompromised host

Patients with solid organ transplantation

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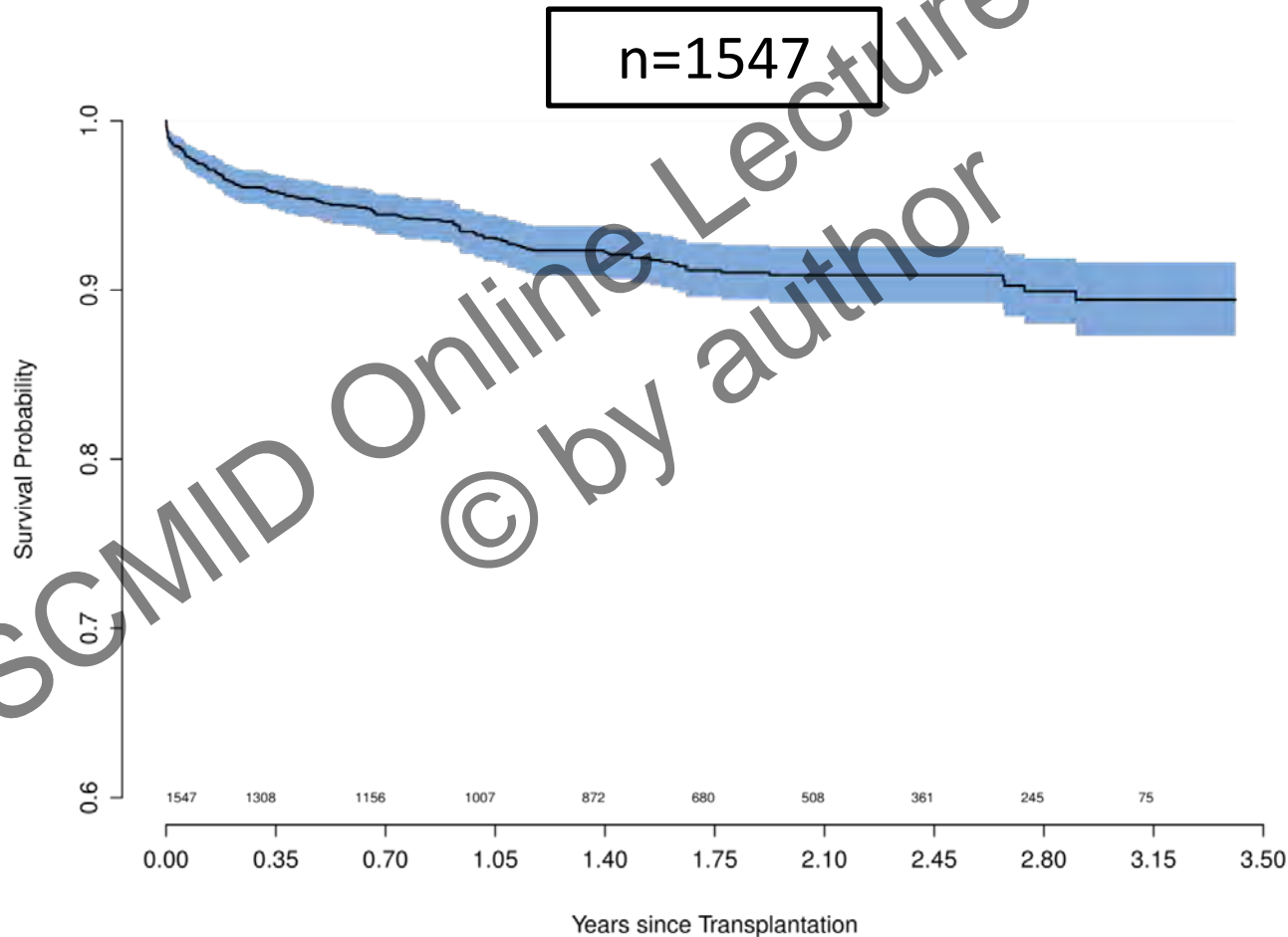


Outline

- Background
- Risk of infection in SOT recipients
- Travel-associated infections
- Prevention measures

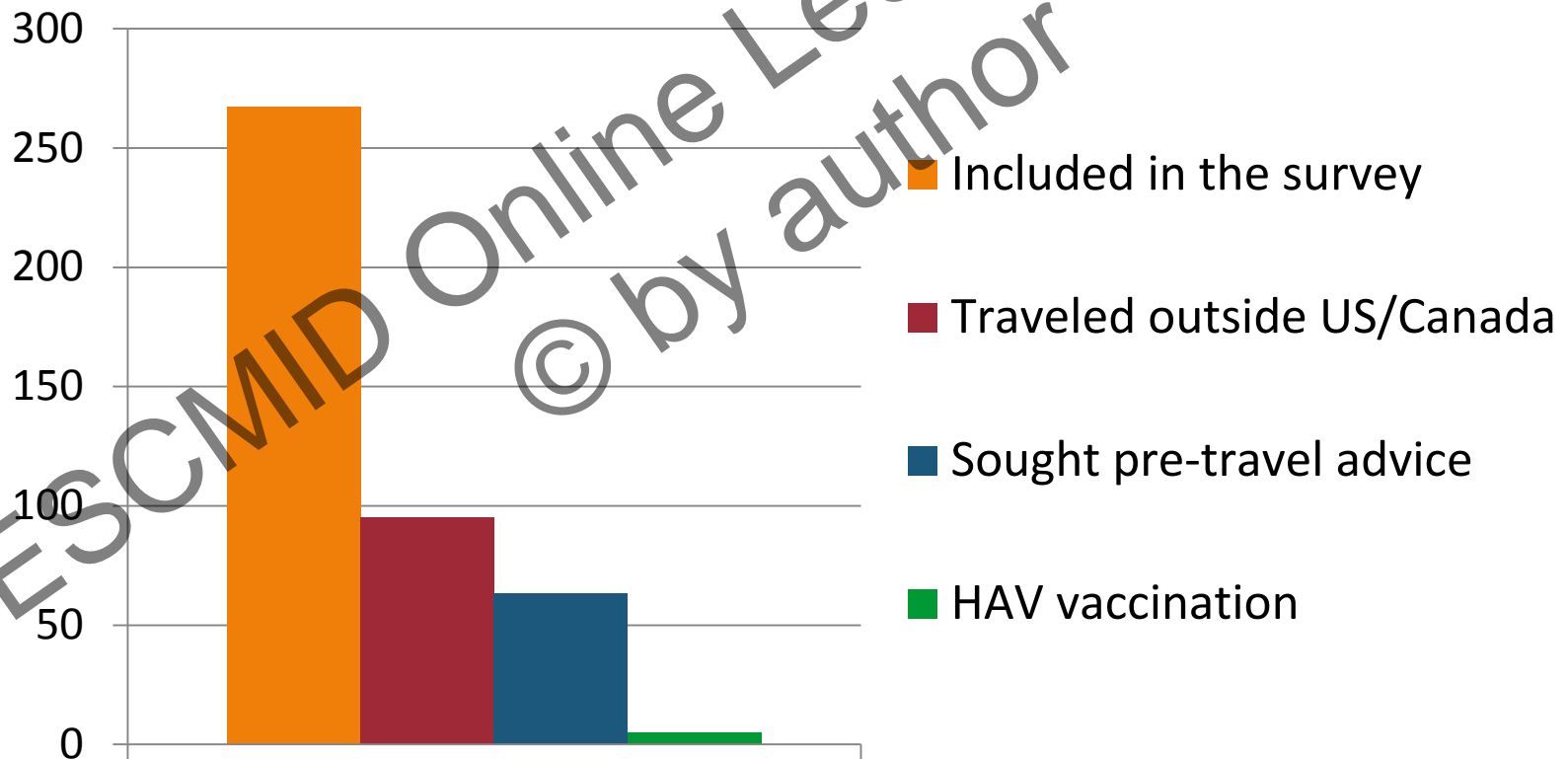
Survival after organ transplantation

Swiss Transplant Cohort Study



Background

Retrospective survey of 267 SOT recipients in Toronto



Background

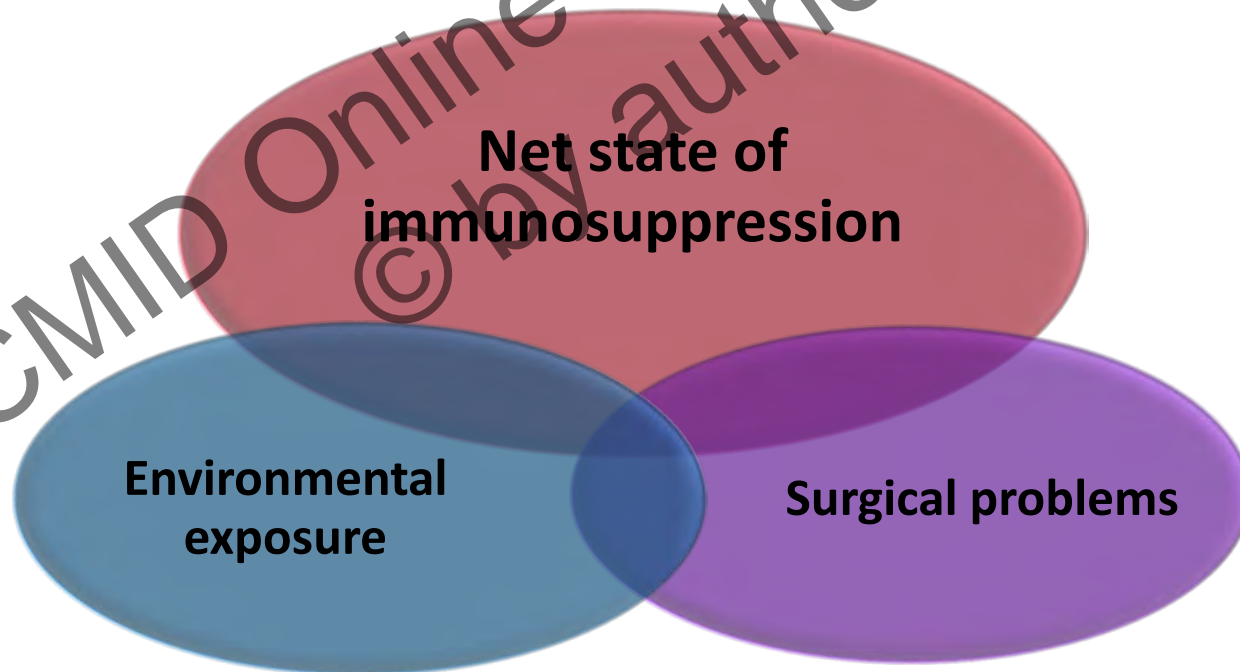
- 290 Kidney transplant recipients in the Netherlands
 - 34% travel outside Europe and North America
 - 22% did not seek travel advice
 - 29% were ill during the journey (diarrhea, fever, respiratory infection)
 - 4 patients were hospitalized (3 diarrhea, 1 cellulitis)

Risk of infection after organ transplantation

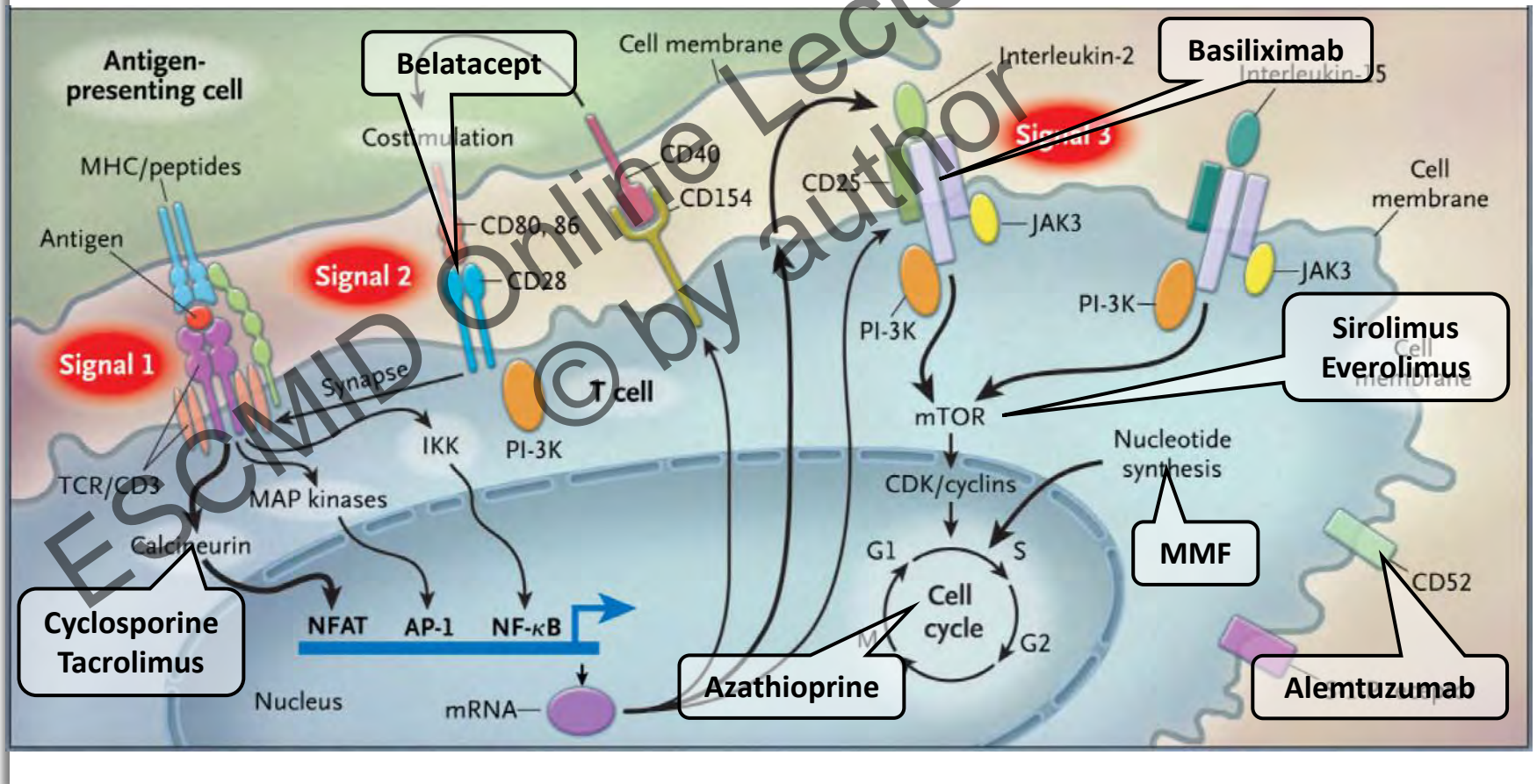
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Risk of infection

No accurate measure of the risk of infection in a given patient
(\neq HIV+; CD4+ T cells count)



Immunosuppressive drugs after kidney transplantation



Organ Transplantation

1st month

- Risk related to surgery/intensive care unit

- Nosocomial infections

1-12 months

- Period of maximal immunosuppression
- Rejection therapy

- Opportunistic infections

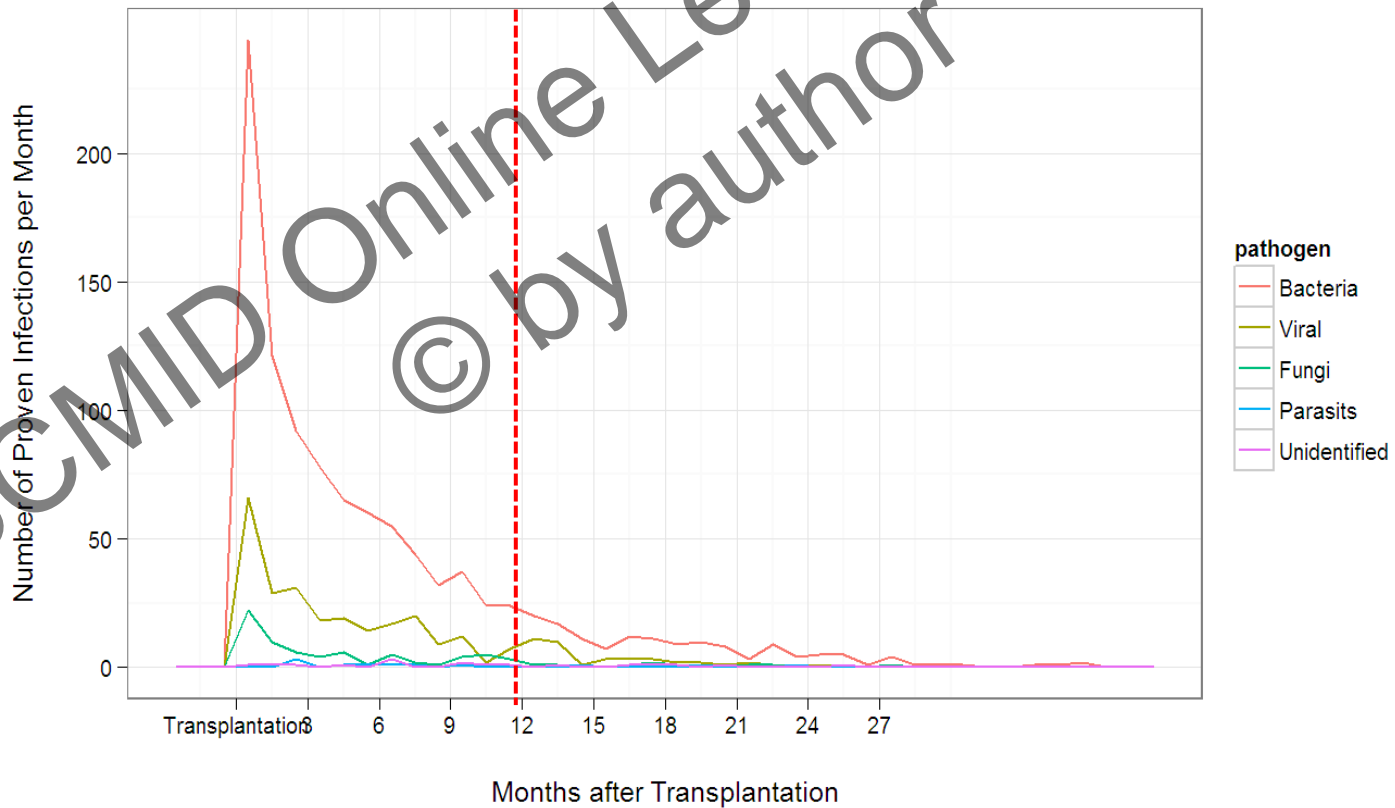
> 1 year

- Life-long immunosuppressive therapy

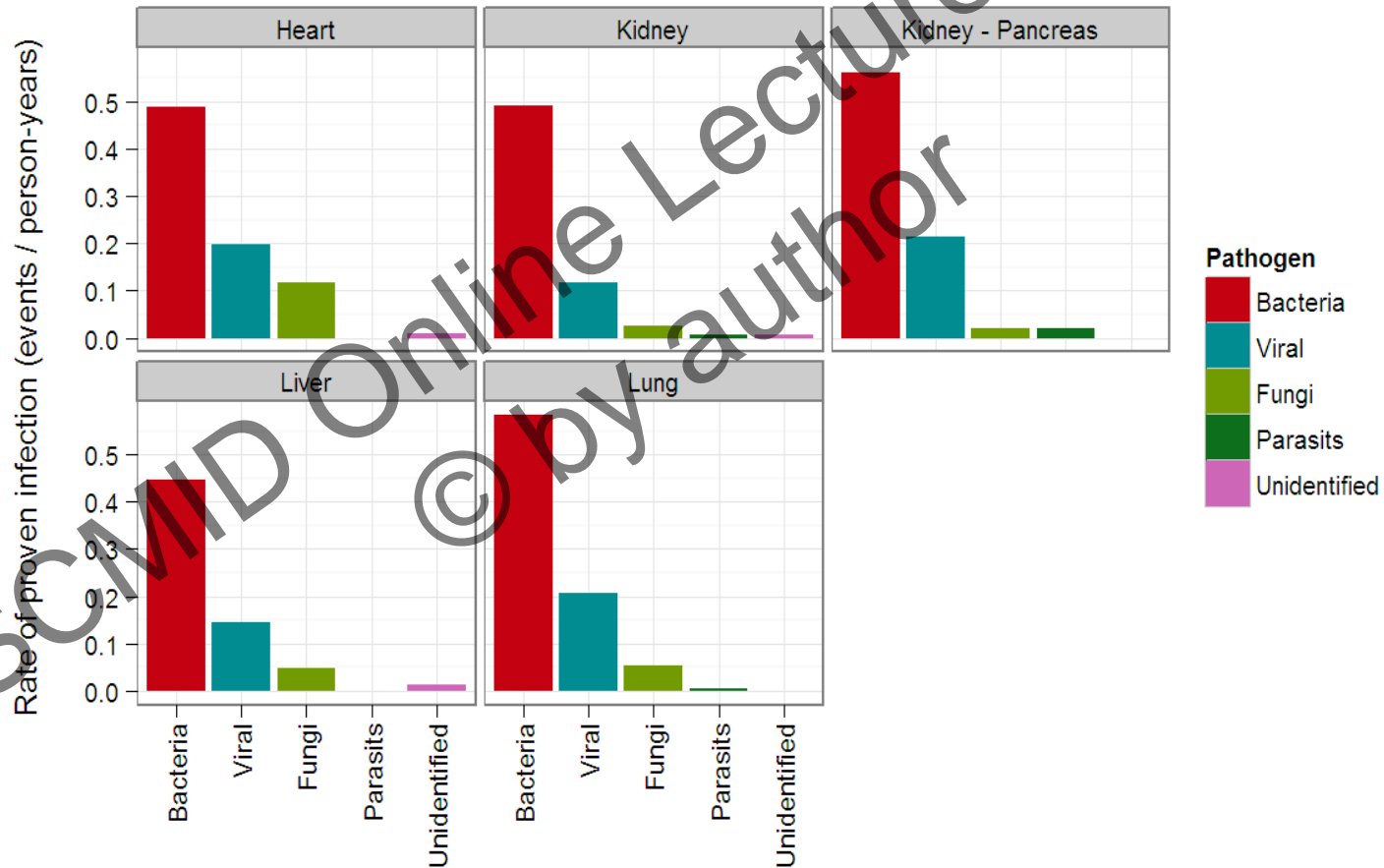
- Community-acquired infections

Infections according to the post transplant period

n=1547



Type of infection after transplant

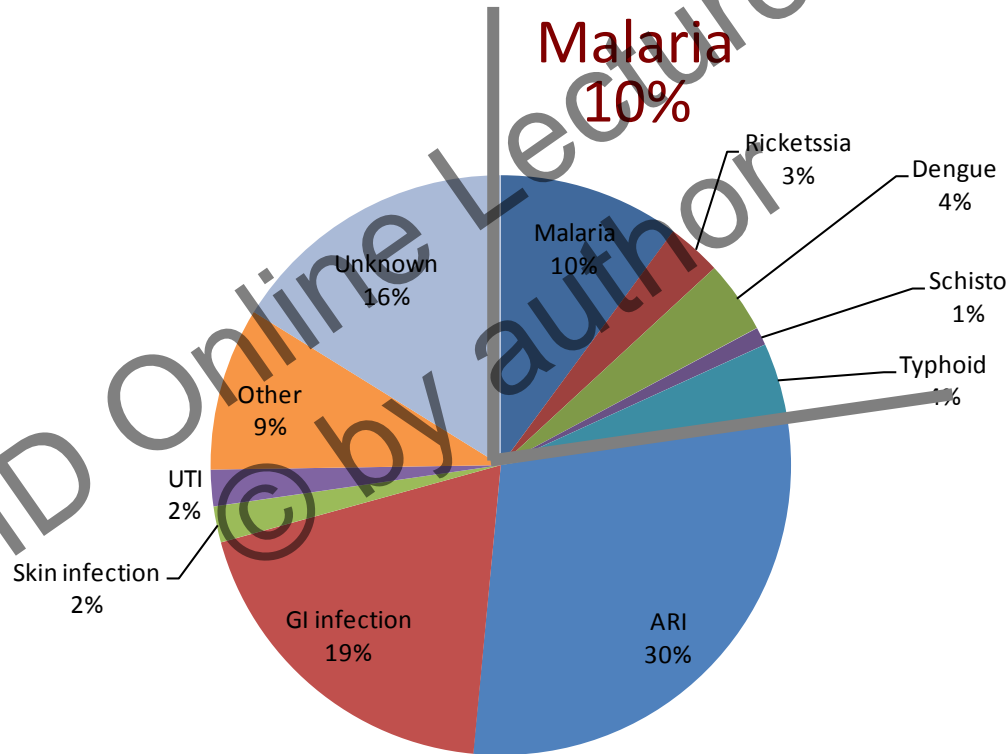


Travel-associated infections

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Fever upon return

Primary care setting



Tropical causes : 22%



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Symptoms of Infectious Diseases in Immunocompromised Travelers: A Prospective Study With Matched Controls

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- 75 adult travelers on immunosuppressive drugs (travel companions serving as matched controls)
- Travel diary
- Ciprofloxacin to be used as immediate self-treatment in case of diarrhea

Diarrhea

Incidence
Duration

Vomiting

Incidence
Duration

Fever

Incidence
Duration

Cough

Incidence
Duration

Rhinitis

Incidence
Duration

Skin infection

Incidence
Duration

Fatigue

Incidence
Duration

Abdominal pain

Incidence
Duration

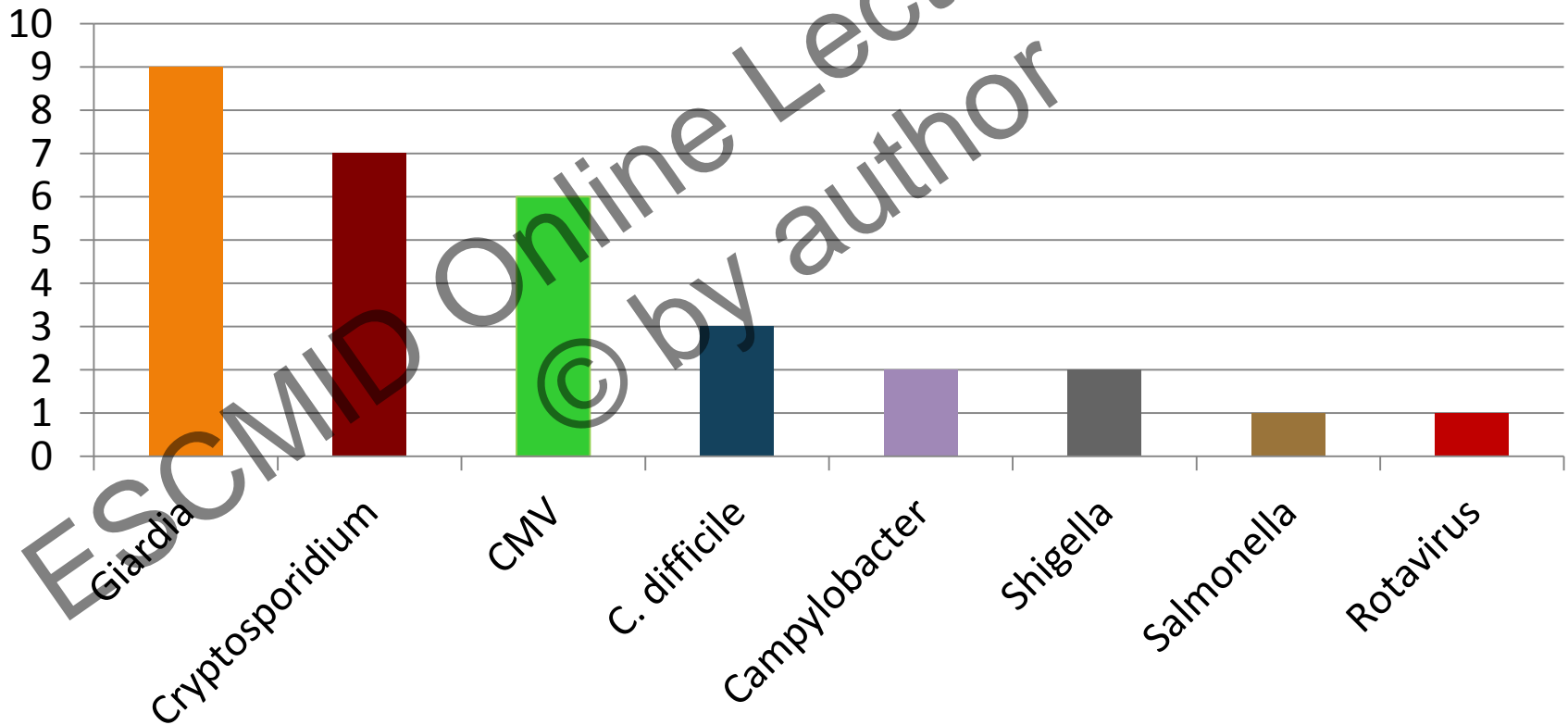


Traveler's diarrhea

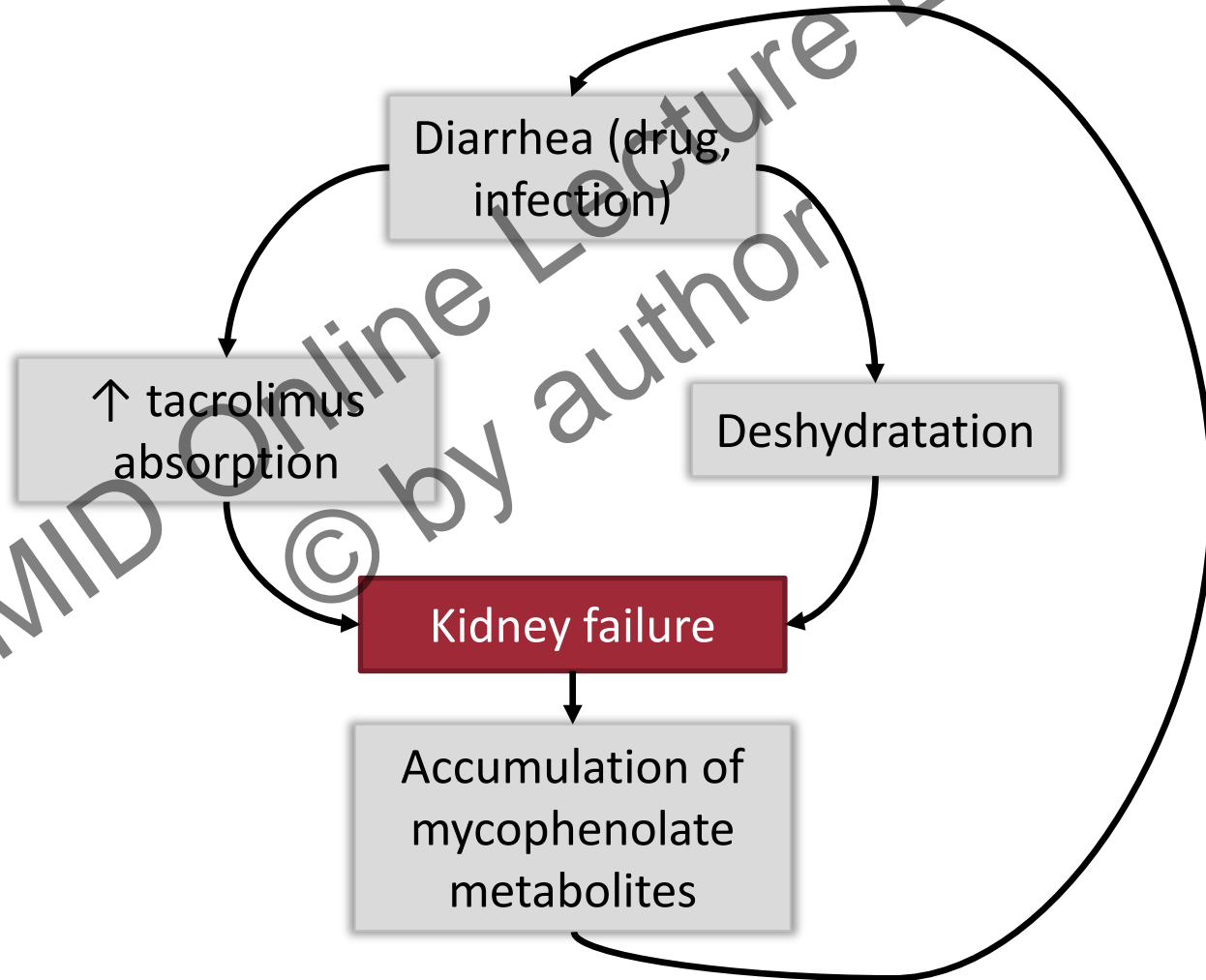
Enteric pathogen	% isolation
Bacteria	50-80%
<i>Escherichia coli</i>	
ETEC	20-50%
EAEC/EIEC	10-15%
<i>Campylobacter</i>	5-30%
<i>Salmonella</i>	5-25%
<i>Shigella</i>	5-15%
<i>Vibrio</i>	5%
Virus	5-25%
Norovirus	0-10%
Rotavirus	0-10%
Parasites	<10%
<i>Giardia</i>	0-10%
<i>Entamoeba</i>	0-10%
No pathogen isolated	10-50%

Diarrhea in SOT recipients in Turkey

33 kidney transplant recipients



Diarrhea in SOT recipients



Azithromycin and Loperamide Are Comparable to Levofloxacin and Loperamide for the Treatment of Traveler's Diarrhea in United States Military Personnel in Turkey

Clinical Infectious Diseases 2007;45:294–301

OPEN ACCESS Freely available online



A Multi-Center Randomised Controlled Trial of Gatifloxacin versus Azithromycin for the Treatment of Uncomplicated Typhoid Fever in Children and Adults in Vietnam

Treatment of Shigellosis: V. Comparison of Azithromycin and Ciprofloxacin

A Double-Blind, Randomized, Controlled Trial

Wasif Ali Khan, MB, BS; Carlos Seas, MD; Ujjwal Dhar, MB, BS; Mohammed Abdus Salam, MB, BS; and Michael L. Bennish, MD

Ann Intern Med. 1997;126:697-703.

Malaria and organ transplantation

- ~50 cases in the literature
- ~80% in kidney transplant recipients
- Mostly transmission from the donor
- Prognosis: good in kidney recipients, poor in heart and liver recipients (time of cold preservation?)

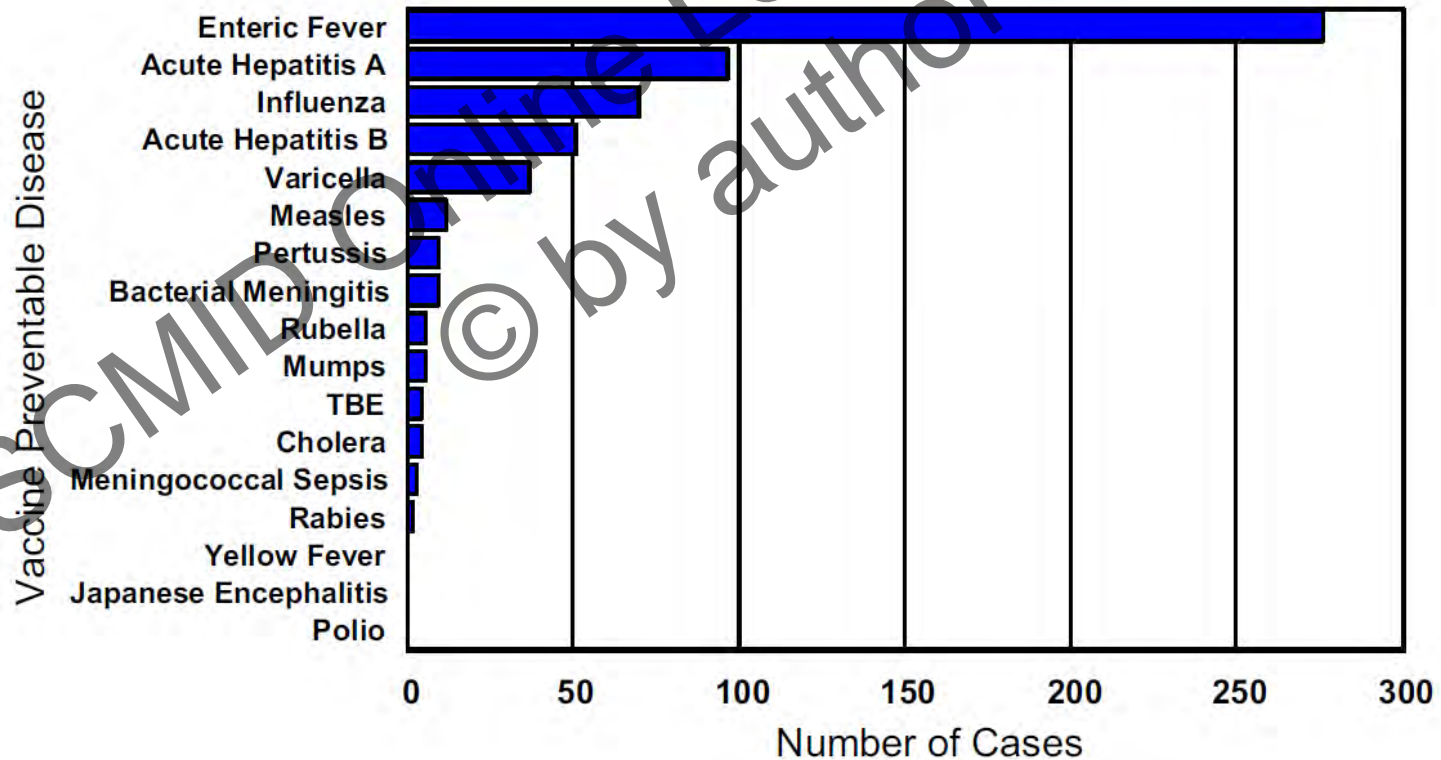
Malaria Prophylaxis

Anti-malaria drug	Calcineurin inhibitor (CNI)	TMT-SMX
Mefloquine	May ↑ CNI levels	May increase risk of cardiac toxicity
Atovaquone/ proguanil		May increase risk of bone marrow toxicity
Doxycycline	May ↑ CNI levels	
Chloroquine	May ↑ CNI levels	May increase risk of cardiac toxicity

Vaccine-preventable diseases after travel

GeoSentinel Surveillance Network

37,542 ill returned travelers



Safety of vaccination after transplant

- Live vaccines are generally contraindicated after solid organ transplantation
 - **Absolutely contraindicated:** Oral polio, live oral typhoid, BCG, yellow fever
 - **Have been occasionally used in SOT recipients (children):** Varicella vaccine, rubella, measles

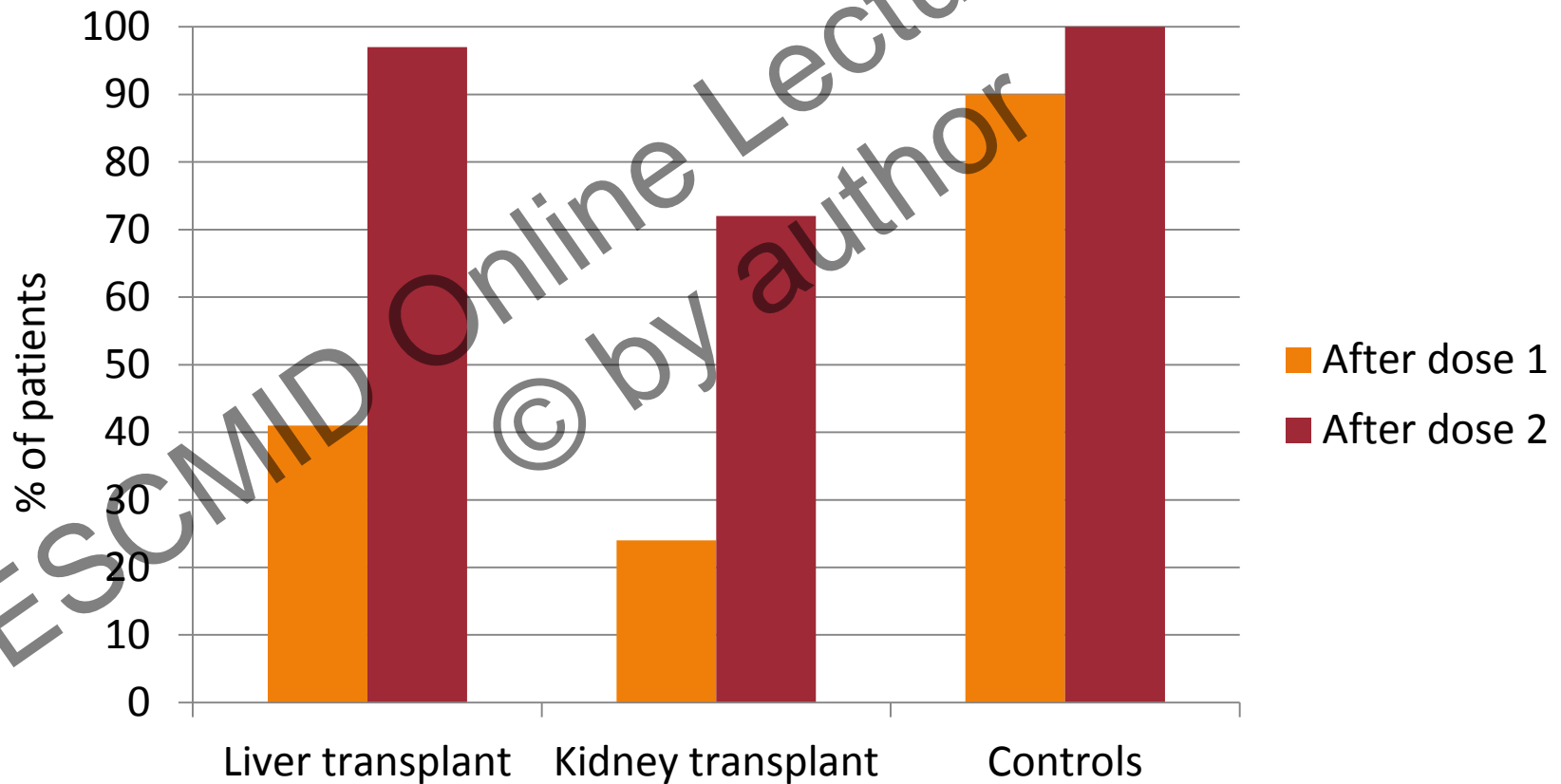
Vaccines should be given before transplantation whenever possible

Efficacy of vaccination after transplant

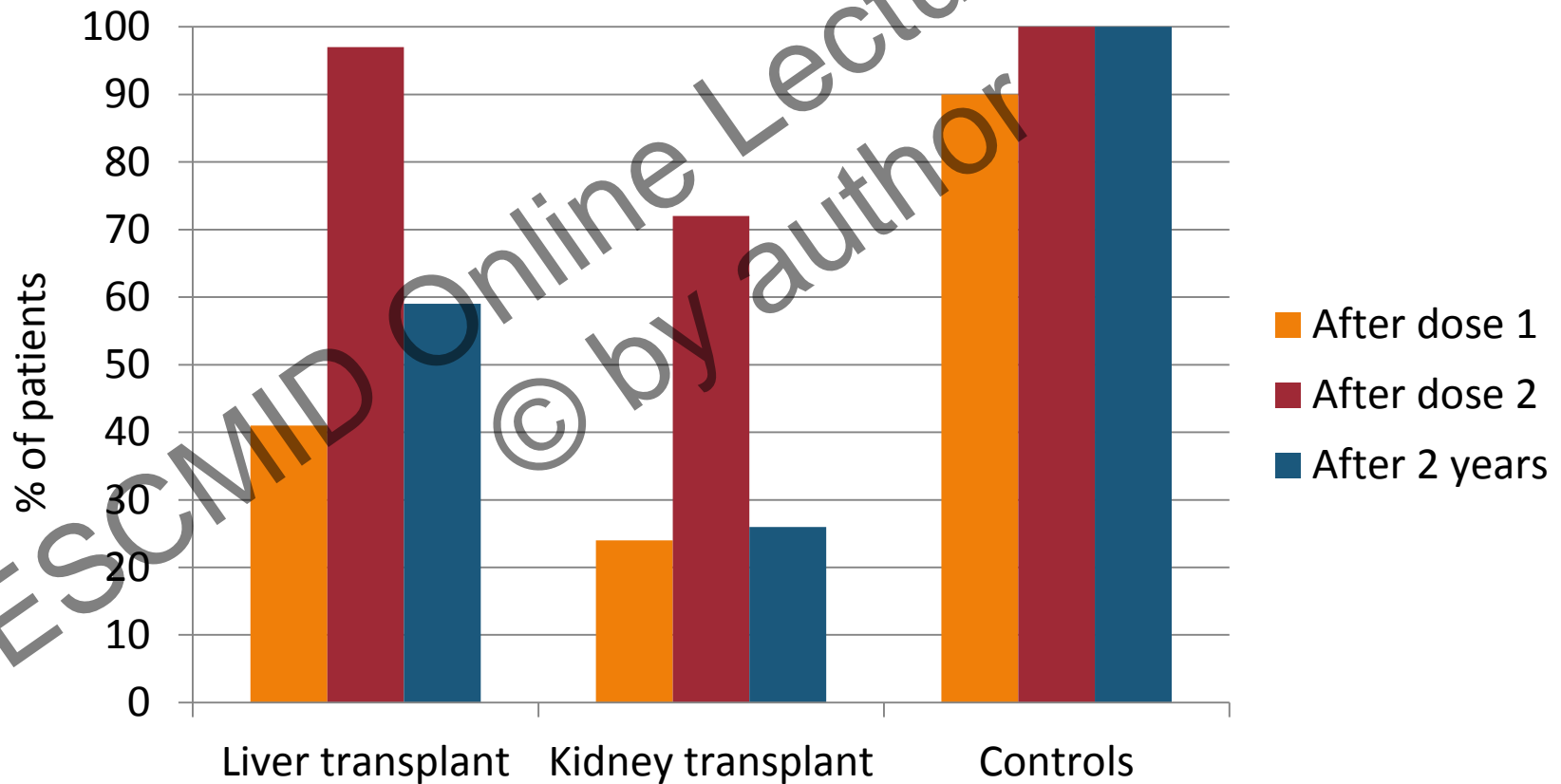
- Few studies have evaluated the **efficacy** of vaccines in SOT recipients, but **immunogenicity** is generally lower after transplant

Vaccines should be given before transplantation whenever possible

Immunogenicity of HAV vaccine in liver and kidney transplant recipients



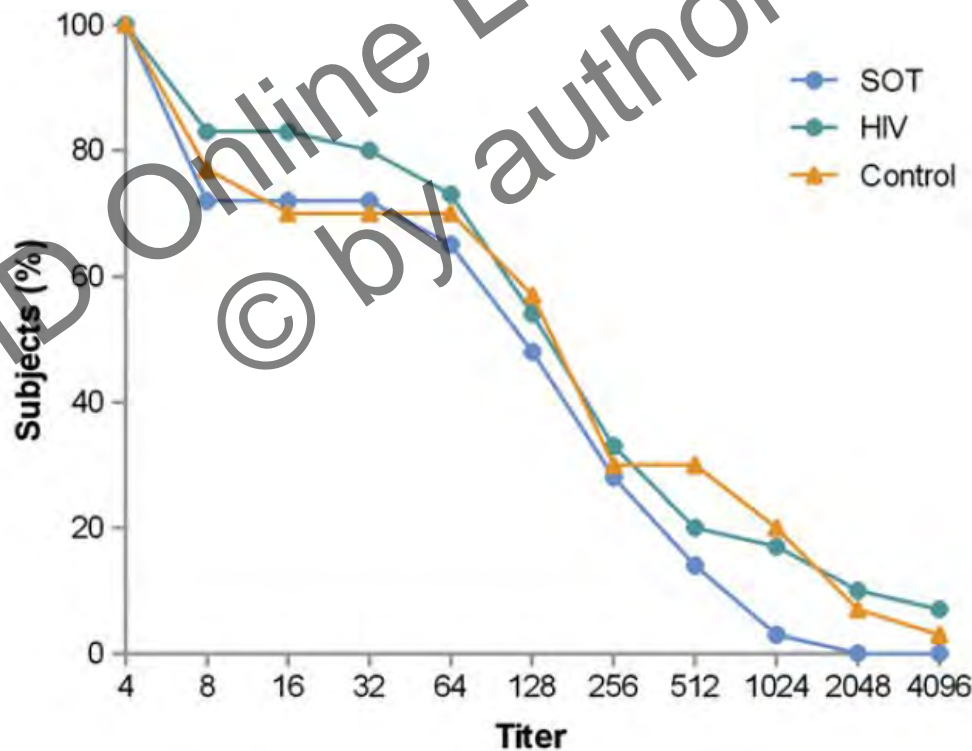
Immunogenicity of HAV vaccine in liver and kidney transplant recipients



Humoral Response to the Influenza A H1N1/09 Monovalent AS03-Adjuvanted Vaccine in Immunocompromised Patients

Oriol Manuel,^{1,2} Manuel Pascual,¹ Katja Hoschler,⁴ Stefano Giulieri,² Deolinda Alves,² Kim Ellefsen,³ Pierre-Alexandre Bart,³ Jean-Pierre Venetz,¹ Thierry Calandra,² and Matthias Cavassini²

¹Transplantation Center, ²Infectious Diseases Service, and ³Division of Immunology and Allergy, University Hospital of Lausanne (CHUV) and University of Lausanne, Switzerland; and ⁴Health Protection Agency, London, United Kingdom



Travel vaccines

Vaccine	Recommendation after transplant
Hepatitis A	Recommended
Hepatitis B	Recommended
Thyphim Vi (im)	Recommended
Inactivated polio	Recommended
Meningococcal	Occasionally recommended
Rabies	Occasionally recommended
Japanese encephalitis	Occasionally recommended
Tick-born encephalitis	Occasionally recommended
S. typhi Ty21a (oral)	Contraindicated
Oral polio	Contraindicated in patients/family members
BCG	Contraindicated
Yellow fever	Contraindicated

Safe travel in transplant recipients

- Avoid travel during the first year post transplant
- Reinforce educational topics
 - Food and water precautions
 - Management of traveler's diarrhea
 - Mosquito precautions
 - Blood/sex born infection precautions
- Every patient travels with antibiotics (azithromycine / quinolone)

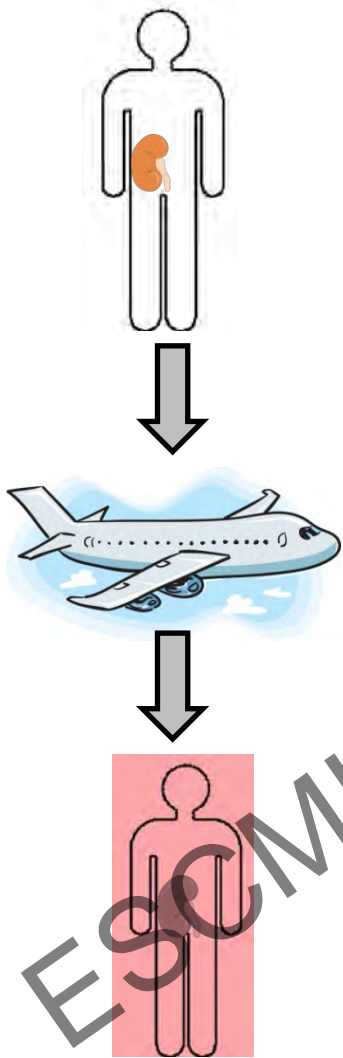
Safe travel in transplant recipients

- Malaria
 - Similar recommendations in malaria prevention than in the immunocompetent traveler
 - Cave interactions: start antimalaric prophylaxis 2-3 weeks before travel for checking immunosuppressive drug level
 - Favoring doxycycline?
- Vaccination
 - Vaccinate before transplantation
 - Avoid live vaccines
 - Update vaccination schedule
 - Control for antibody response when possible

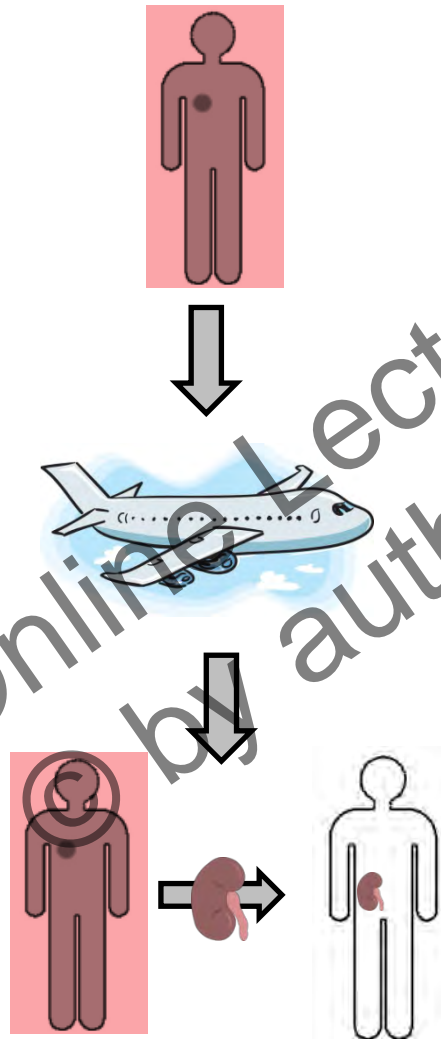
Thanks for your attention



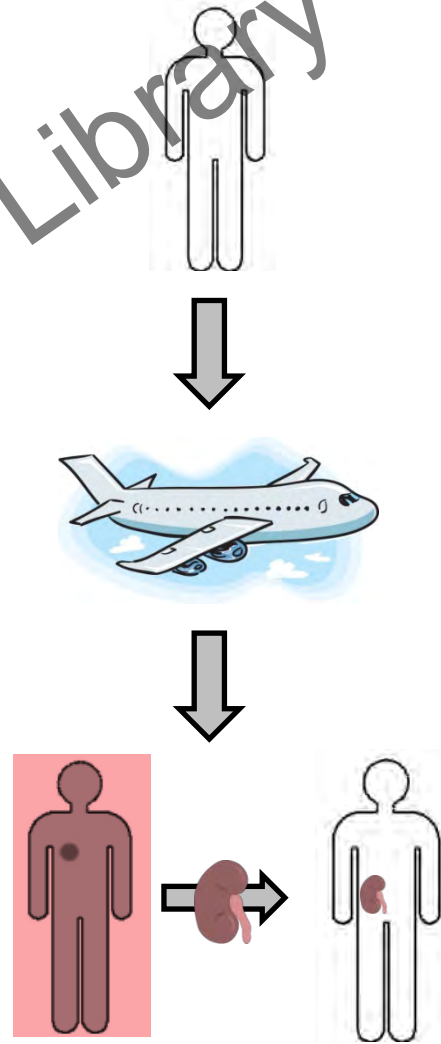
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Travel-related infection



Donor-derived infection



Transplant tourism