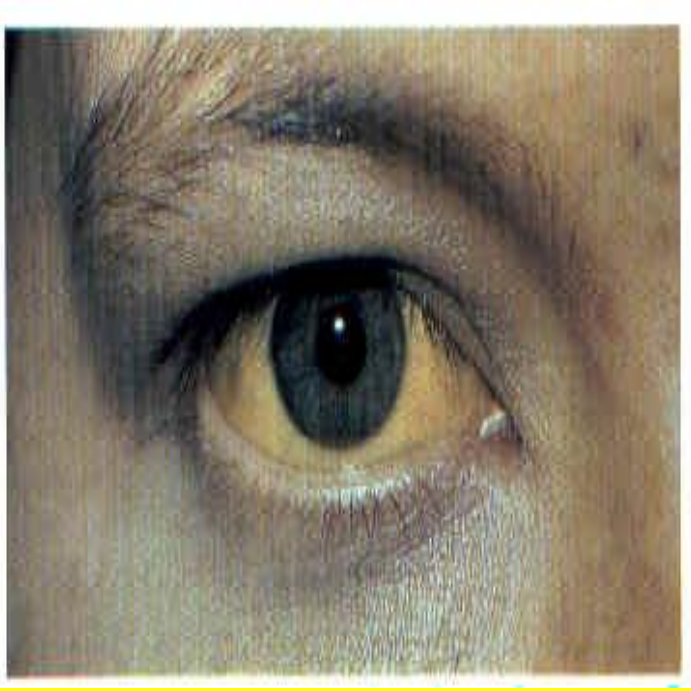




Human Immunoglobulin Therapy for Endemic Infectious Diseases

Lucile Blumberg
National Institute for Communicable Diseases
South Africa

NATIONAL HEALTH LABORATORY SERVICE
NATIONAL INSTITUTE FOR COMMUNICABLE DISEASES



1895 -diphtheria antitoxin from immunized horses injected into child

Diphtheria alert as 8-year-old succumbs to deadly bacteria

● Child dead, two in hospital ● No anti-toxin ● Disease last seen in Durban 26 years ago

NOSIPHO MNGOMA
STAFF REPORTER

A DISEASE last seen in Durban 26 years ago has killed a child and left doctors – using antibiotics – fighting to save two others who are critically ill.

A health official said three more children were "strongly suspected" of being infected with diphtheria, a highly contagious bacterial disease.

"One was admitted to hospital this past weekend. This patient and another were being treated in a public hospital. The third case is in a private hospital. We say suspected because, although there has been a clinical diagnosis, lab tests are yet to confirm it," he said.

The disease is preventable through vaccination, but requires booster shots.

The National Institute for Communicable Diseases (NICD) said the 8-year-old boy who died was transferred from Prince Mshiyeni Hospital to Inkosi Albert Luthuli Central Hospital after running a fever for three days. He had massively swollen tonsils and a "bull neck" which made it difficult for him to breathe. An emergency tracheotomy had to be performed.

In spite of some initial improvement with antibiotic treatment in intensive care, he "developed unexpected complications and died".

University of KwaZulu-Natal clinical microbiology lecturer, Dr Yacoob Coovadia, said diphtheria could damage the heart, nerves or kidneys within 10 days to two weeks. "So even if the child initially survives because of proper care, they can still die from the damage caused to the body."

Coovadia said because the disease was so uncommon, South Africa – as well as many other countries – did not keep the antibody which neutralises the toxin released by the diphtheria bacteria.

"It is only stocked in India and Israel, and by the time the procedure to import it is complete, it may be too late because the antibody only works if administered early," he said.

"DIPHTHERIA CAN DAMAGE THE HEART, NERVES OR KIDNEYS ... SO EVEN IF PROPER CARE IS RECEIVED, A CHILD CAN STILL DIE FROM THE DAMAGE TO THE BODY

Diphtheria could only be eradicated through a successful immunisation programme, Coovadia said. "Children are vaccinated at 6, 10 and 14 weeks and booster doses (are administered) at 18 months, 6 and 12 years old."

The NICD said the mother of the boy who died had confirmed her son had not received the second booster vaccine two years ago. It was also discovered that this was the case with the second child, also 8 years old. The third, a 9-year-ol
er doses either.

Two of the chil
tion in uMlazi, w
being treated at RK Khan Hospital, is from Chatsworth.

Coovadia said the sudden resurgence of diphtheria, which ironically coincides with Global Vaccination Week, was "extremely concerning" especially as the airborne bacteria could be spread through sneezing and coughing.

Patients were generally kept in strict isolation.

Because of this, their families and those who had been in close contact with the children are tested and given antibiotics as a preventative measure.

After the outbreak, the Department of Health conducted a "catch-up" vaccination campaign in the area and schools.

Cape Argus, April 30 2015

Curr Opin Hematol. 2015 Nov;22(6):521-6. doi: 10.1097/MOH.0000000000000191.

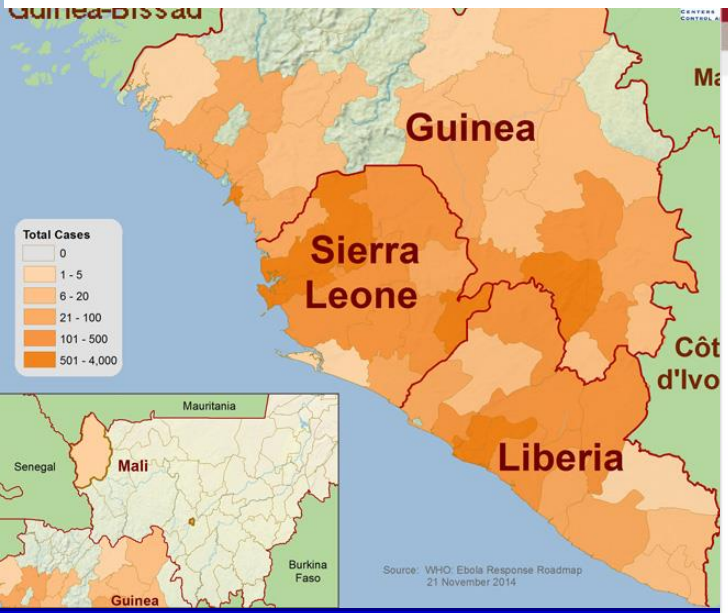
The use of convalescent plasma to treat emerging infectious diseases: focus on Ebola virus disease.

Winkler AM[1], Koepsell SA.

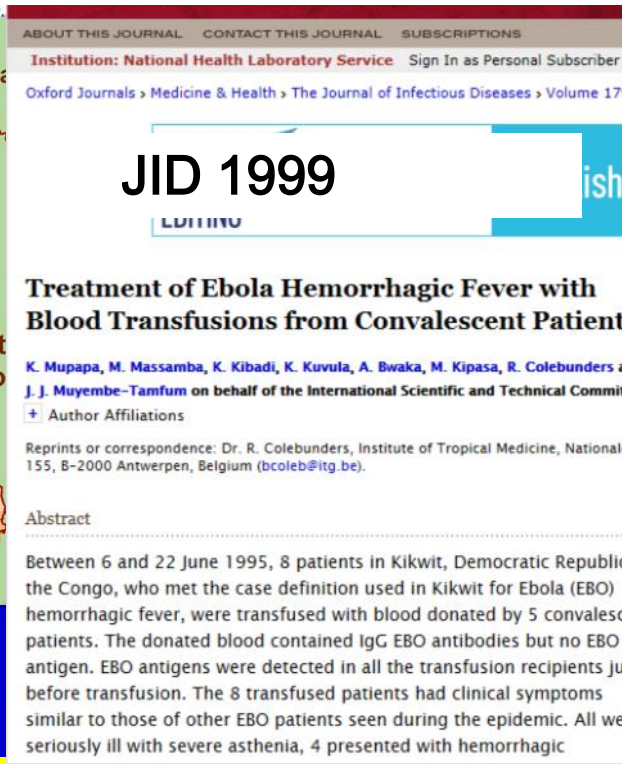
Author information

Abstract

PURPOSE OF REVIEW: The purpose of this review is to discuss the use of convalescent plasma for the tre
focusing on the recent use for the treatment of Ebola virus disease (EVD).



Ebola outbreak 2013-15
28 601 cases, 11 299 deaths



ABOUT THIS JOURNAL CONTACT THIS JOURNAL SUBSCRIPTIONS

Institution: National Health Laboratory Service Sign In as Personal Subscriber

Oxford Journals › Medicine & Health › The Journal of Infectious Diseases › Volume 17

JID 1999

Treatment of Ebola Hemorrhagic Fever with Blood Transfusions from Convalescent Patient

K. Mupapa, M. Massamba, K. Kibadi, K. Kuvula, A. Bwaka, M. Kipasa, R. Colebunders
J. J. Muyembe-Tamfum on behalf of the International Scientific and Technical Commit

+ Author Affiliations

Reprints or correspondence: Dr. R. Colebunders, Institute of Tropical Medicine, National 155, B-2000 Antwerpen, Belgium (bcoleb@itg.be).

Abstract

Between 6 and 22 June 1995, 8 patients in Kikwit, Democratic Republi the Congo, who met the case definition used in Kikwit for Ebola (EBO) hemorrhagic fever, were transfused with blood donated by 5 convales patients. The donated blood contained IgG EBO antibodies but no EBO antigen. EBO antigens were detected in all the transfusion recipients ju before transfusion. The 8 transfused patients had clinical symptoms similar to those of other EBO patients seen during the epidemic. All we seriously ill with severe asthenia, 4 presented with hemorrhagic

Ebola: a call for blood transfusion strategy in sub-Saharan Africa

Lancet 2014

WHO has stated that convalescent blood or plasma is an option in the treatment of Ebola.[1] In 1999, transfusion of locally collected convalescent blood helped decrease Ebola mortality.[2] WHO recommends collection of convalescent plasma to treat patients in the fight against the Ebola outbreak.[1] As there is an estimated 70% mortality, a randomised clinical evaluation involving 50 patients, receiving convalescent and control normal plasma, would be sufficient to confirm the usefulness of this approach in treatment strategies.

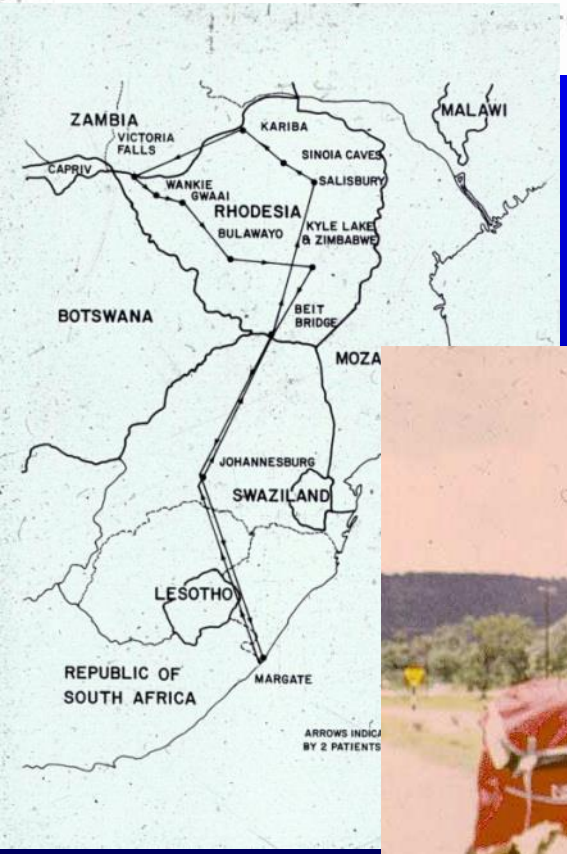
Capacity building for the collection and testing of sufficient convalescent blood or plasma from recovered Ebola patients is crucial. However,

”Ebola is not untreatable, it is untreated’ physician, Liberia Dec 2014

Outbreak of Marburg virus disease in Johannesburg

J S S GEAR, G A CASSEL, A J GEAR, B TRAPPLER, L CLAUSEN, A M MEYERS, M C KEW, T H BOTHWELL, R SHER, G B MILLER, J SCHNEIDER, H J KOORNHOF, E D GOMPERTS, M ISAÄCSON, J H S GEAR

other two p
treatment an





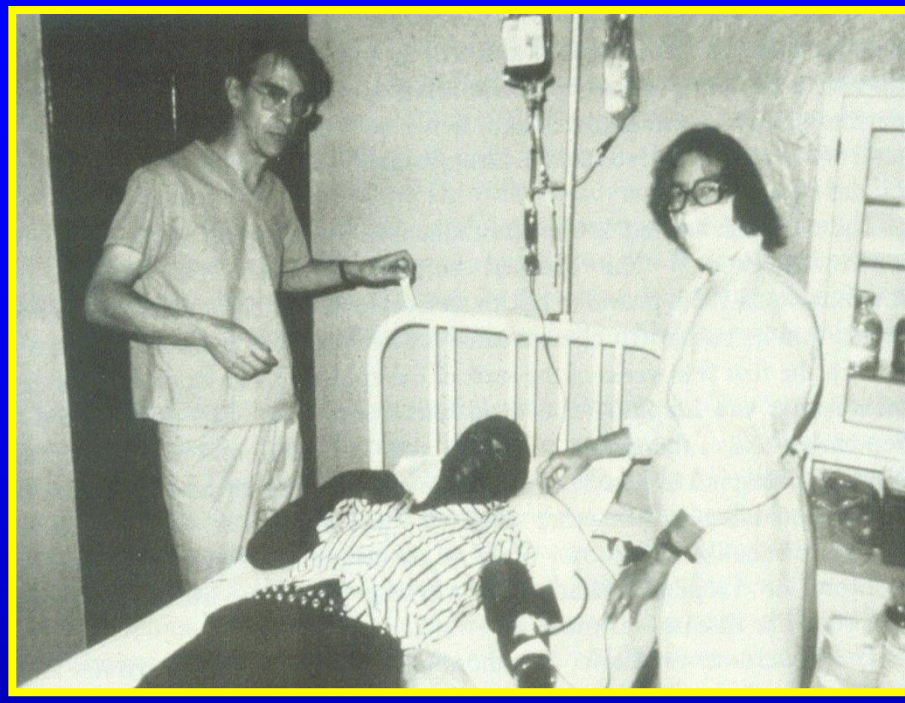


Johannesburg 1975



‘They asked me whether plasma could be supplied to Zaire where there appeared to be an outbreak of Marburg virus disease in the rainforests of the Congo River basin ‘

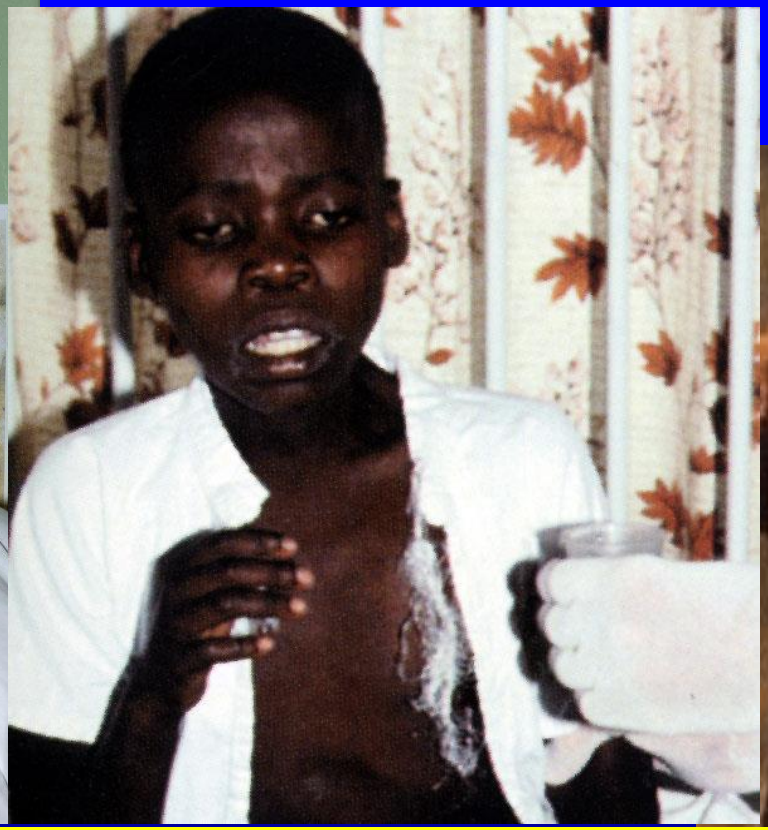
I informed the Foreign Affairs official that Marburg plasma is rarer than hen’s teeth and that I was quite willing to make it available provided I took it myself to ensure its appropriate use’ .



Ebola Outbreak, Zaire 1976

•**Margarethe Isaäcson - Memoirs ASTM 2008**







55 000 deaths globally

Highest fatality of any communicable disease

Preventable by post- exposure prophylaxis (PEP)

Post-exposure prophylaxis (PEP)

WHO Rabies Guidelines 2014

- **WOUND CLEANING**
- Rabies vaccine - intramuscular 0, 3, 7, 14, (28) (Essen)

PLUS

- **Rabies immunoglobulin for category 3 exposures**

Failures of post-exposure rabies prophylaxis.

Wilde H. Vaccine 2007

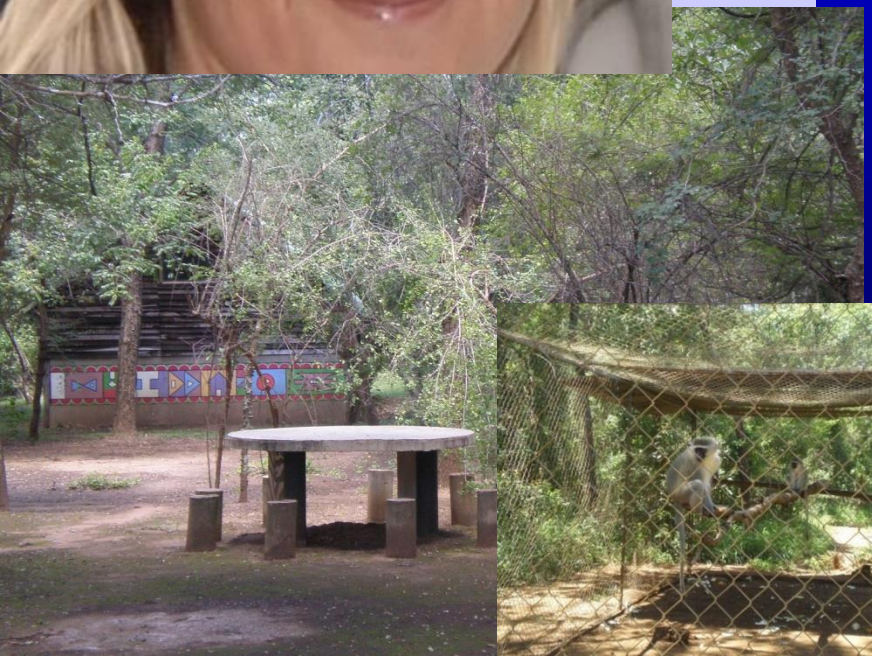
.

'True failures, where all was done according to WHO recommendations, are fortunately extremely rare.

Most common failures are due to deviations from WHO management recommendations and lack of essential biologicals.

- **“A woman in Northern Ireland who contracted rabies while in South Africa has died in hospital in Belfast”**
  J Med Viro 2010





- 55yr old woman, Zambia mine
- Bitten by own dog, died
- Rabies vaccine course, no RIG
- Died 6 weeks later- rabies confirmed
-
- NICD Communique 2005

2 children: aged 7 and 9 years bitten by crazy/aggressive dog in village near Sun City, NW province







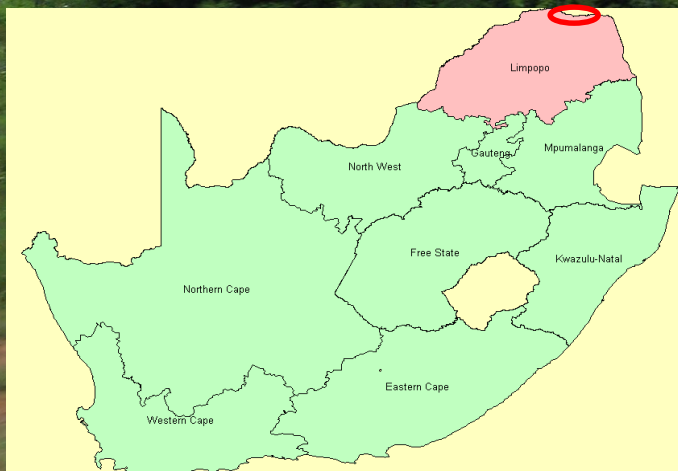




Figure 2. Bat Bite (Arrows) on the Finger.
The bite occurred in a 23-year-old man as he handled a bat.

RABIES OUTBREAK – Limpopo South Africa
31 human cases





EID 2007

PEP Burden

- 8 million animal bites receive PEP annually in India alone[1]
- Up to 50% of exposed individuals do not receive appropriate PEP (including modern cell culture vaccines)[1]
- Asia also carries 96.5% of the economic burden of rabies in the developing world with US$ 560 million spent each year on PEP (WHO)

1 Association for Prevention and Control of Rabies in India (APCRI): Report of the WHO sponsored national multi-centric rabies survey. 2004.





Equine RIG versus Human RIG

Evaluation of Cost-Effective Strategies for Rabies Post-Exposure Vaccination in Low-Income Countries

"A universal switch to **intradermal delivery of vaccine** would improve the affordability and accessibility of PEP for bite victims, leading to a likely reduction in human deaths human rabies deaths as well as being economical for healthcare providers"

Hampson Cleaveland and Briggs

Plos Neglected Tropical Diseases 2011

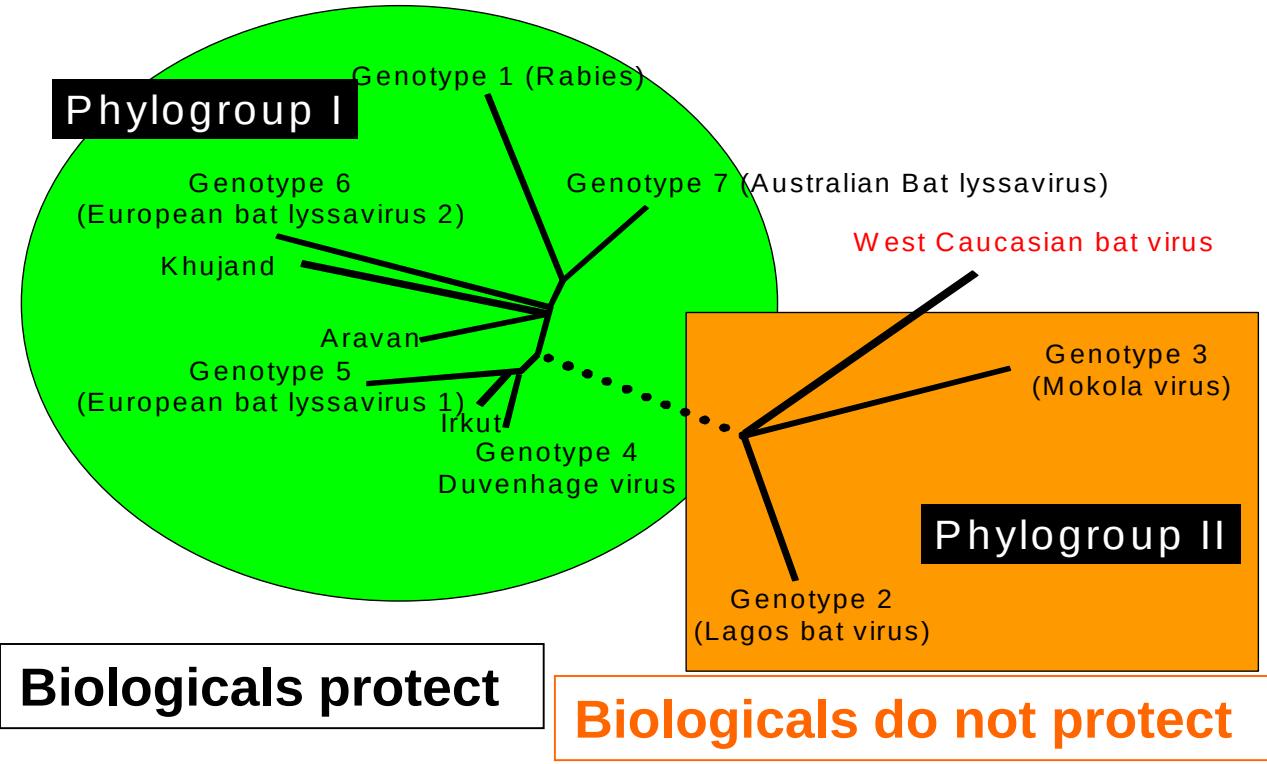
- So you had a brush with a bat?
- Forget about any 'maybes'
- Get yourself injected quick
- Or else you risk the rabies...



Fatal Human Infection with Rabies-related Duvenhage Virus, South Africa

Janusz T. Paweska,* Lucille H. Blumberg,* Charl Liebenberg,† Richard H. Hewlett,‡ Antoinette A. Grobbelaar,* Patricia A. Leman,* Janice E. Croft,* Louis H. Nel,§ Louise Nutt,‡ and Robert Swanepoel*

Duvenhage virus was isolated from a patient who died of a rabieslike disease after being scratched by a bat early in 2006. This occurred ≈80 km from the site where the only other known human infection with the virus had occurred 36 years earlier.



Biologicals protect

Biologicals do not protect

RABIES (EBLV-2), NORWAY MAINLAND, DAUBENTON'S BAT, CONFIRMED
Promed 12 Nov 2015

ELSEVIER

Available online at www.sciencedirect.com
ScienceDirect

Vaccine 25 (2007) 2800–2810

Vaccine

www.elsevier.com/locate/vaccine

Identification and characterization of a human monoclonal antibody that potently neutralizes a broad panel of rabies virus isolates☆

Susan E. Sloan[a], Cathleen Hanlon[b], William Weldon[b], Michael Niezgoda[b], Jesse Blanton[b], Josh Self[b], Kirk J. Rowley[a], Robert B. Mandell[a,1], Gregory J. Babcock[a],

Survival after Treatment of Rabies with Induction of Coma

Rodney E. Willoughby, Jr., M.D., Kelly S. Tieves, D.O., George M. Hoffman, M.D., Nancy S. Ghanayem, M.D., Catherine M. Amlie-Lefond, M.D., Michael J. Schwabe, M.D., Michael J. Chusid, M.D., and Charles E. Rupprecht, V.M.D., Ph.D.

N Engl J Med 2005;352:2508-14.





Monday May 28 | 2012 The Time

Last hope for family

Experimental drug is rabies victim's last hope

Patient put into medically induced coma

Anderson, a top canoeist, died last week after machines were switched off.

Scientist American

Rabies Control : dog vaccination





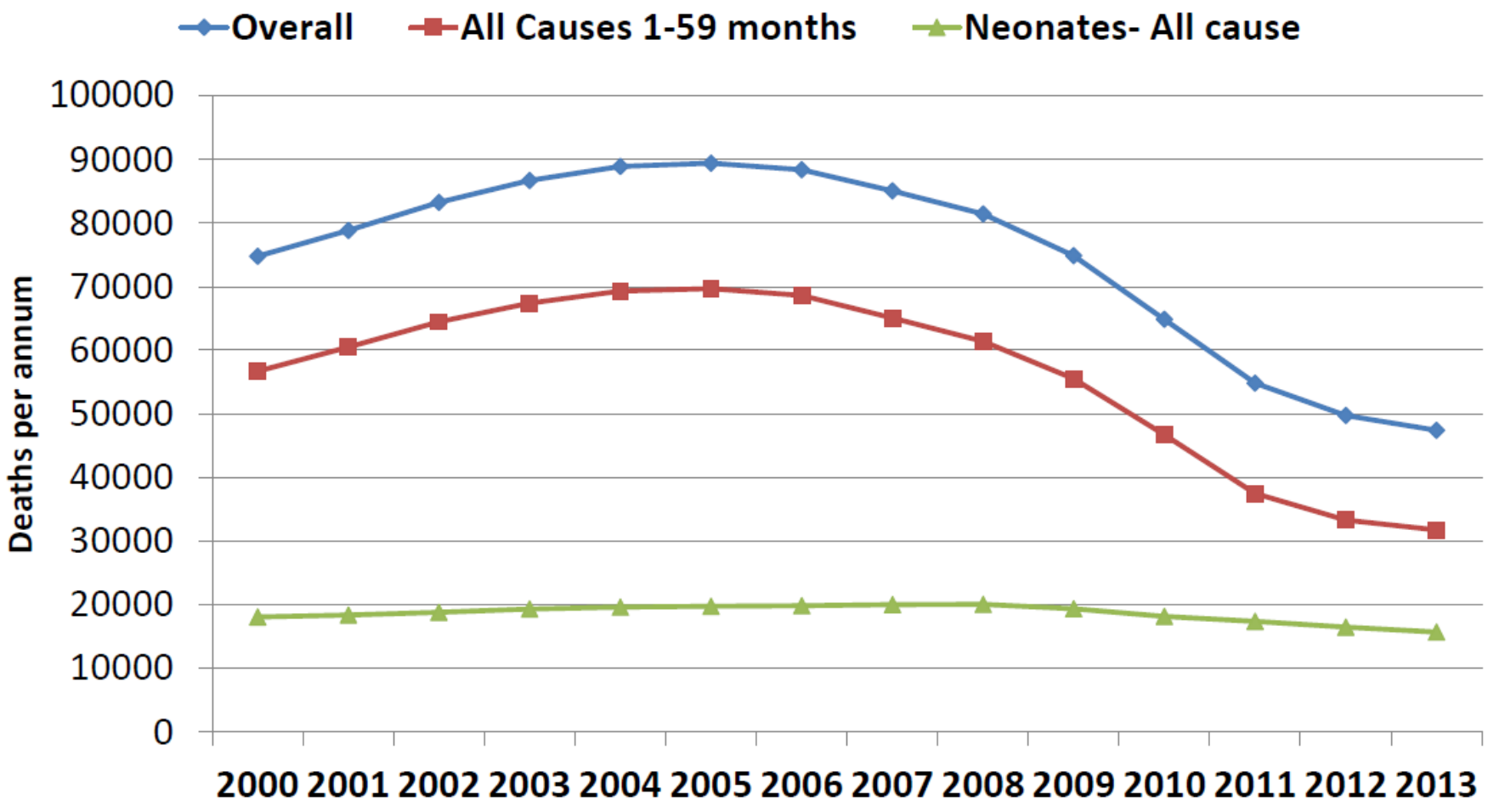
The Feasibility of Canine Rabies Elimination in Africa: Dispelling Doubts with Data

Limbo et al Plos Negl Trop Dis 2010



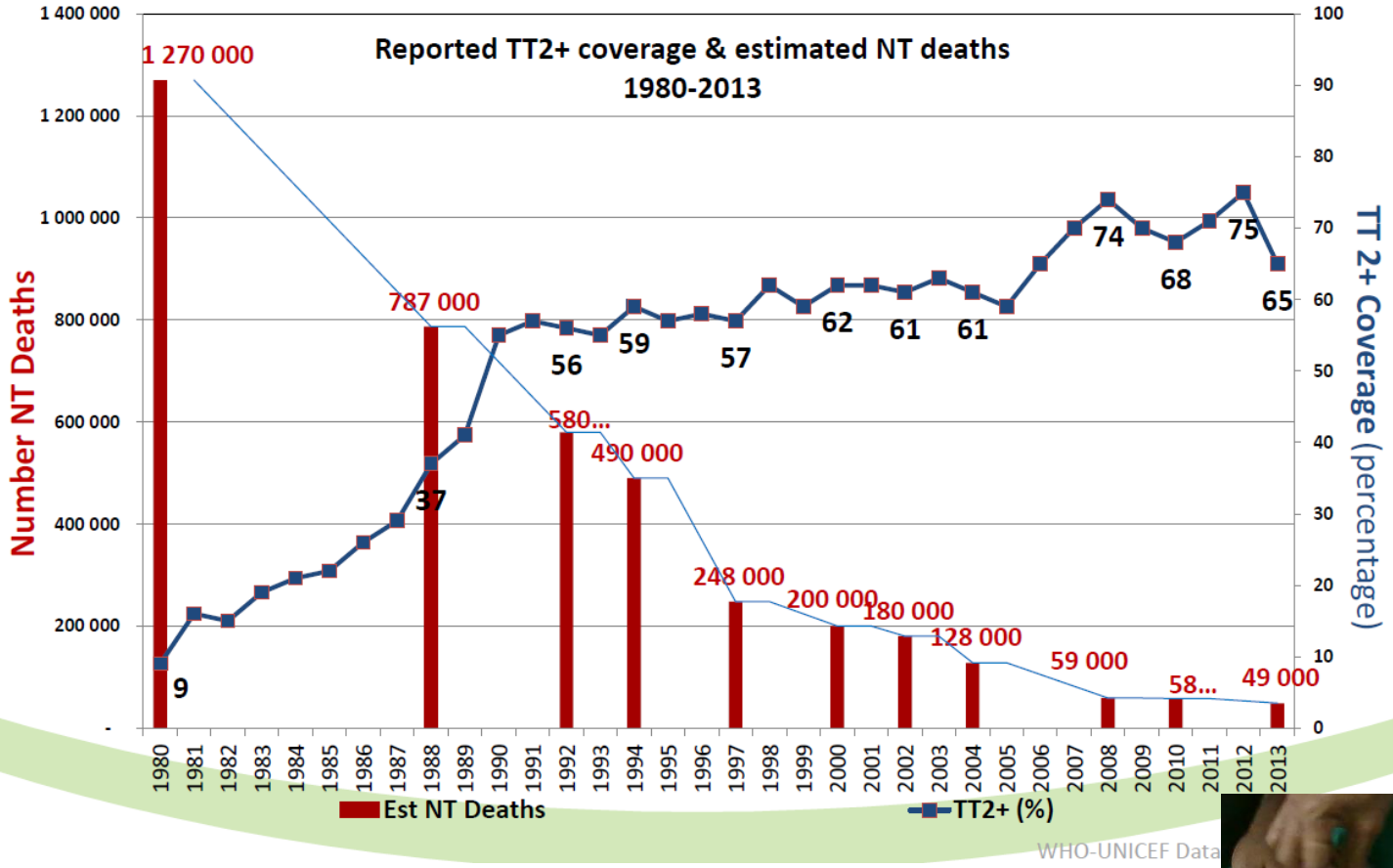


Trends in under-5 mortality rates in South Africa, 2000 to 2013



Under-5 Childhood deaths increased from 74,753 in 2000, peaked at 89,418 in 2005 and has now declined to 47,409 in 2013.

Neonatal Tetanus Global Annual Reported Cases and TT2plus coverage, 1980-2013



WHO-UNICEF Data

Khan *et al. BMC Public Health* 2013, **13**:322
http://www.biomedcentral.com/1471-2458/13/322

BMC Public Health

RESEARCH ARTICLE Open Access

Interventions to reduce neonatal mortality from neonatal tetanus in low and middle income countries - a systematic review

Adeel Ahmed Khan, Aysha Zahidie* and Fauziah Rabbani



Role of passive immunization in prevention and treatment of tetanus





Tetanus – a health threat after natural disasters
Ann of Int Med 2011

Varicella zoster immunoglobulin

- Persons at risk for severe and complicated disease- neonates, immunocompromised persons

COMMUNICABLE DISEASES COMMUNIQUÉ

VOLUME 5 NO 7 JULY 2006

Varicella outbreak

An outbreak of chickenpox was reported from a hospice caring for adult AIDS patients in Gauteng. To date a total of 7 cases have been identified with 3 deaths. Given the high risk of severe disease and mortality in this setting control

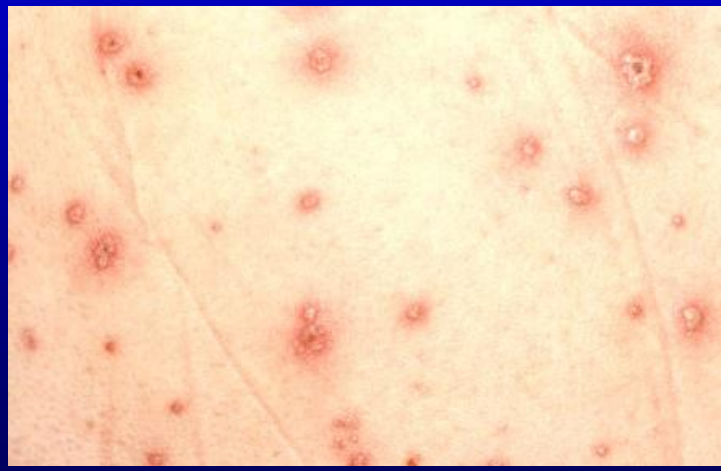
Varicella outbreak in AIDS hospice JHB

and was given varicella immunoglobulin. At present the hospice will remain closed to new admissions.

Primary varicella zoster virus infection (chickenpox) is a common infection in childhood and usually follows an uncomplicated course in healthy children. Certain groups are at risk for severe and complicated disease. This includes adults, the immunocompromised, pregnant individuals and neonates (in the first 4 weeks of life). These individuals should be managed aggressively with early use of acyclovir (or equivalent) and careful follow-up for complicated disease.

Non-immune contacts of cases of chickenpox that are at risk for severe disease should receive post exposure prophylaxis with varicella zoster immunoglobulin VZIG (available in SA as Vazigam®) as early as possible following exposure (preferable within 96 hours). VZIG may still attenuate disease if given up to 10 days post exposure. VZIG is also recommended for infants whose mothers develop chickenpox in the period 7 days before to 7 days after delivery or who have contact with a case in the first 7 days of life. Pregnant women exposed to case should be tested for varicella IgG and given VZIG if they are antibody negative.

Source: Epidemiology Unit, NICD





The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 OCTOBER 25, 2007 VOL. 357 NO. 17

Hepatitis A Vaccine versus Immune Globulin for Postexposure Prophylaxis

John C. Victor, Ph.D., M.P.H., Arnold S. Monto, M.D., Tatiyana Y. Surdina, M.D., Saida Z. Suleimenova, M.D., Gilberto Vaughan, Ph.D., Omana V. Nainan, Ph.D.,* Michael O. Favorov, M.D., Ph.D., Harold S. Margolis, M.D., and Beth P. Bell, M.D., M.P.H.

Hepatitis B Immunoglobulin

‘Universal Hepatitis B Vaccine coverage’

- Reduction of perinatal transmission for newborn infants of HBsAg+ mothers
- Health workers – non responders - post exposure

Cochrane Library 2003

Elimination of Measles



Measles outbreak in oncology unit . Cape Town 2015

NICD Communique 2015


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affordable

