

Riunione fondativa del Gruppo di Studio
della Società Italiana di Neurologia

Società Italiana di Neurologia e paesi in via di sviluppo

Milano, 20 marzo 2019
Istituto Neurologico Besta, Biblioteca Centrale



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Sin
SOCIETÀ ITALIANA DI NEUROLOGIA



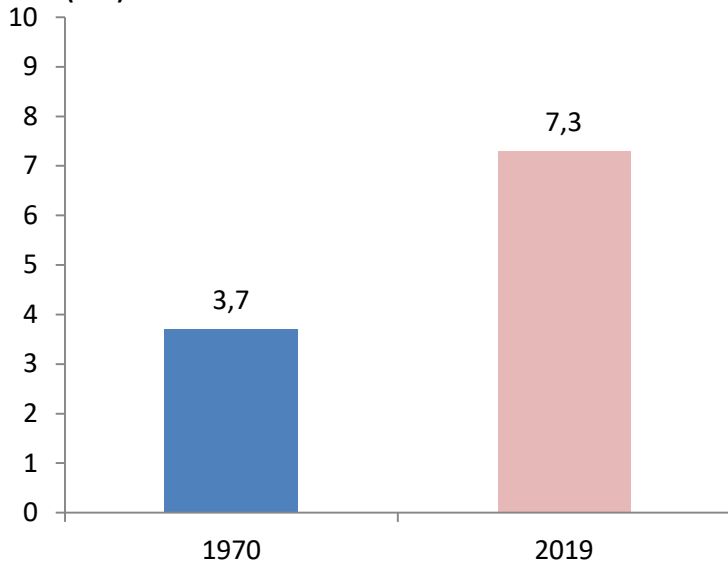
- Orientamenti del nuovo Gruppo di Studio
- Un primo obiettivo concreto: avviare un centro epilessia in Africa, quali modelli

Gruppo di Studio SIN paesi in via di sviluppo - Africa

- **Perché**
- **Gestione delle malattie neurologiche e formazione**
- **Quali modelli in Africa subsaariana**
- **Dalla teoria alla pratica: avviare un centro epilessia in Africa subsaariana (e non solo)**

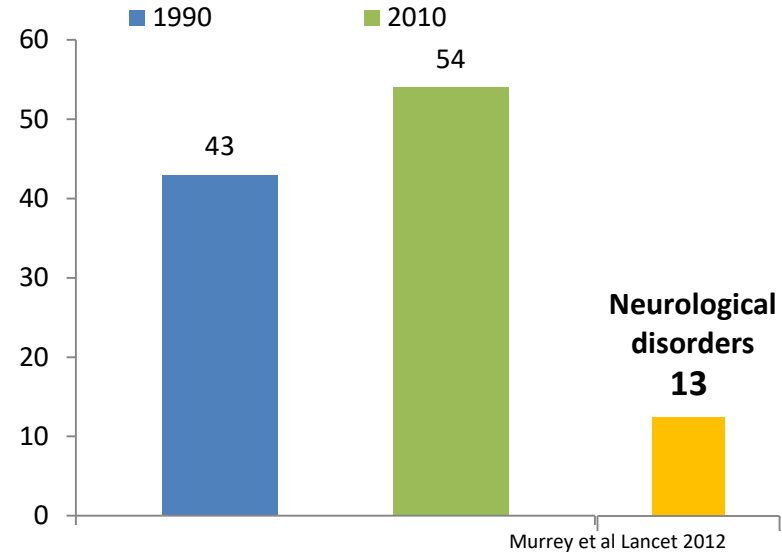
Popolazione mondiale

Abitanti (mld)



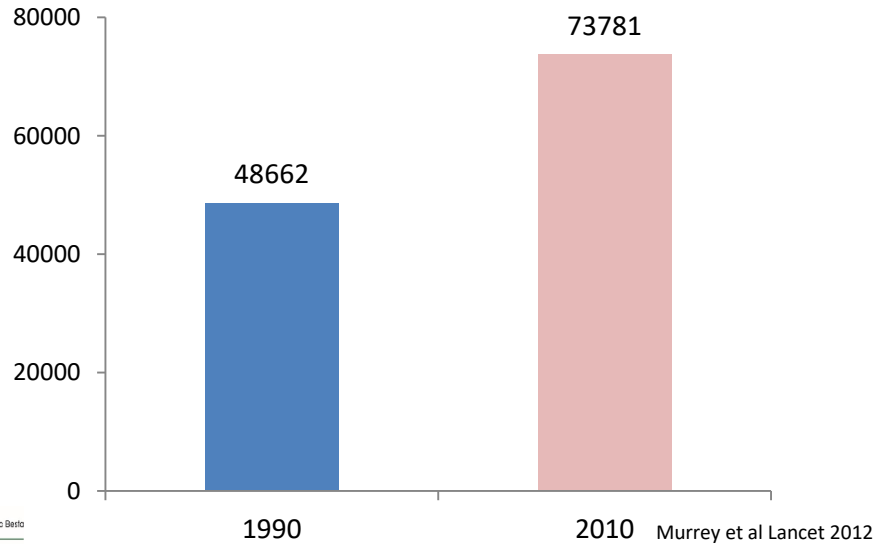
Non Communicable Diseases (NCD)

DALYS %

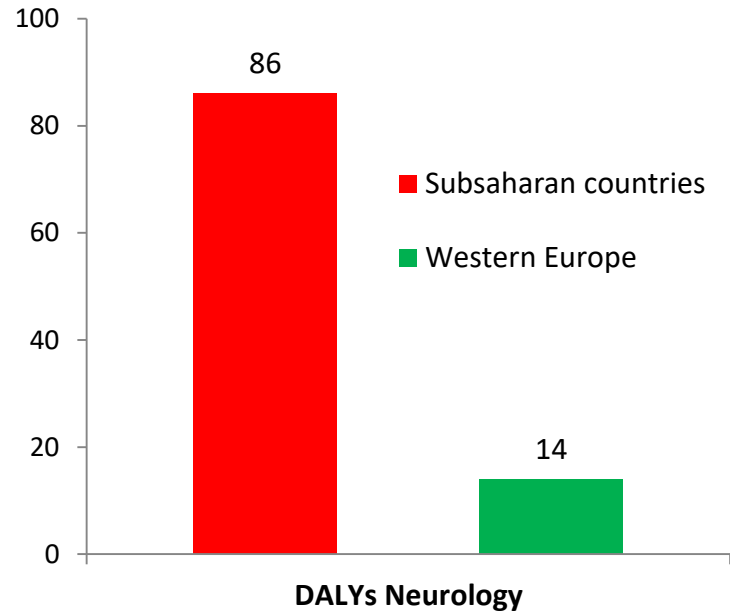


Neurological disorders DALYs: + 51,6% (No cerebrovascular disease)

DALYS



%



Epidemiologic and health transition in sub-Saharan Africa

Population 2000-2015

2986 J. Bongaarts *Population growth*

Life expectancy 2000-2016

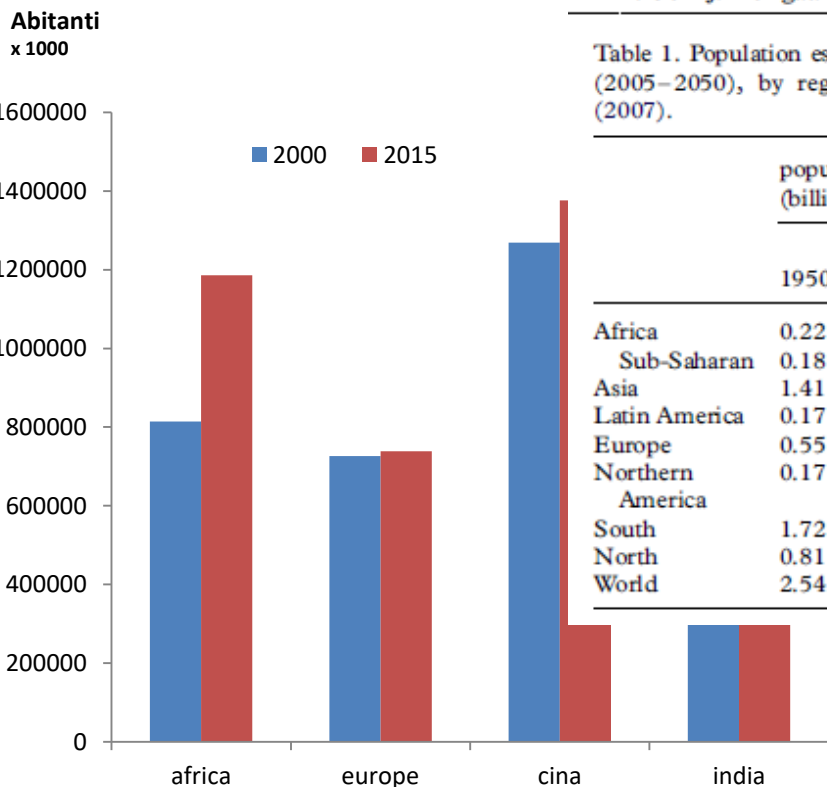
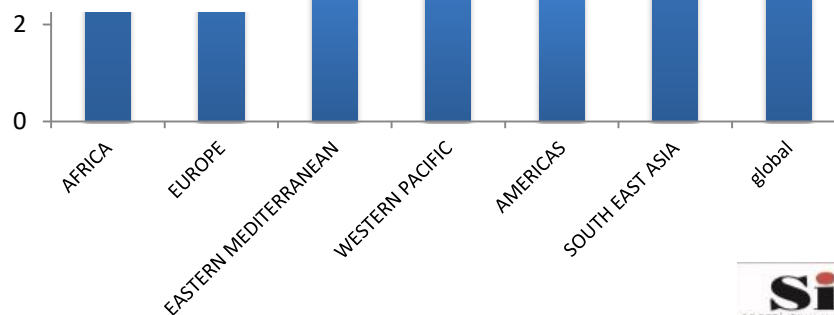


Table 1. Population estimates (1950–2005) and projections (2005–2050), by region. Adapted from United Nations (2007).

	population (billions)			% increase	
	1950	2005	2050	1950–2005	2005–2050
Africa	0.22	0.92	2.00	311	117
Sub-Saharan	0.18	0.77	1.76	327	129
Asia	1.41	3.94	5.27	179	111
Latin America	0.17	0.56	0.77	233	38
Europe	0.55	0.73	0.66	33	-9
Northern America	0.17	0.33	0.45	94	34
South America	1.72	5.30	7.95	208	50
North America	0.81	1.22	1.25	49	2
World	2.54	6.51	9.19	157	41



Sub-Saharan Africa: the double burden of CDs and NCDs

People living with HIV by WHO region, 2017 (in million)

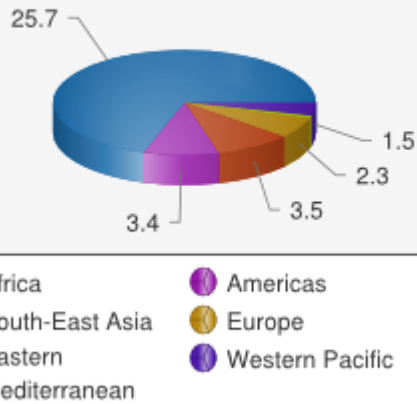
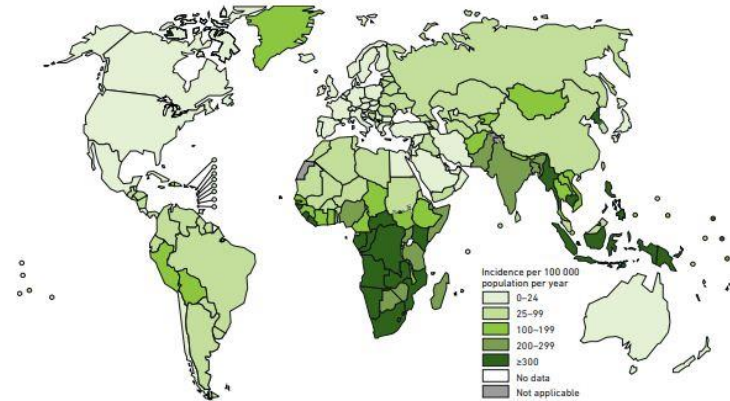
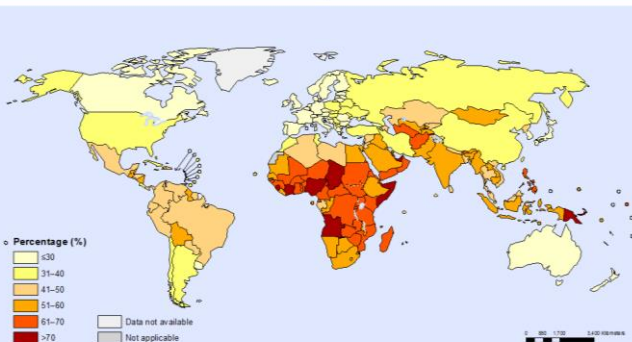


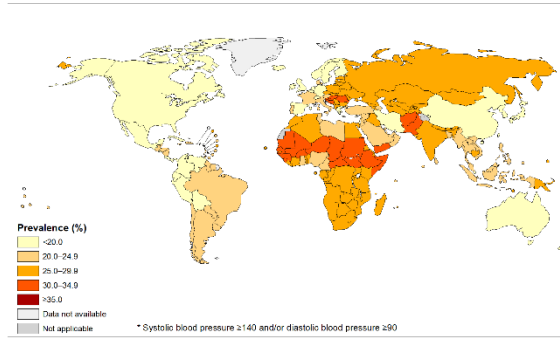
FIG. 3.4
Estimated TB incidence rates, 2017



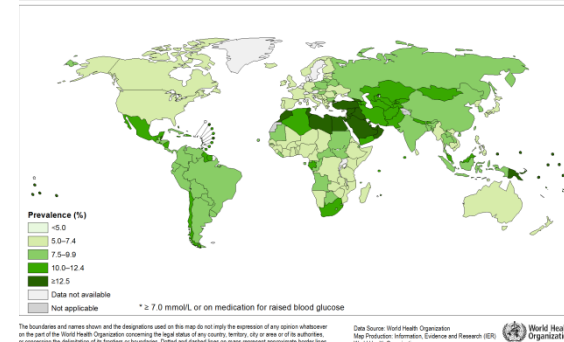
Percentage of deaths due to noncommunicable diseases occurring under age of 70 Both sexes, 2015



Prevalence of raised blood pressure*, ages 18+, 2015 (age standardized estimate) Both sexes



Prevalence of raised fasting blood glucose*, ages 18+, 2014 (age standardized estimate) Both sexes



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization
Map Production: Information, Evidence and Research (IER)
World Health Organization



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

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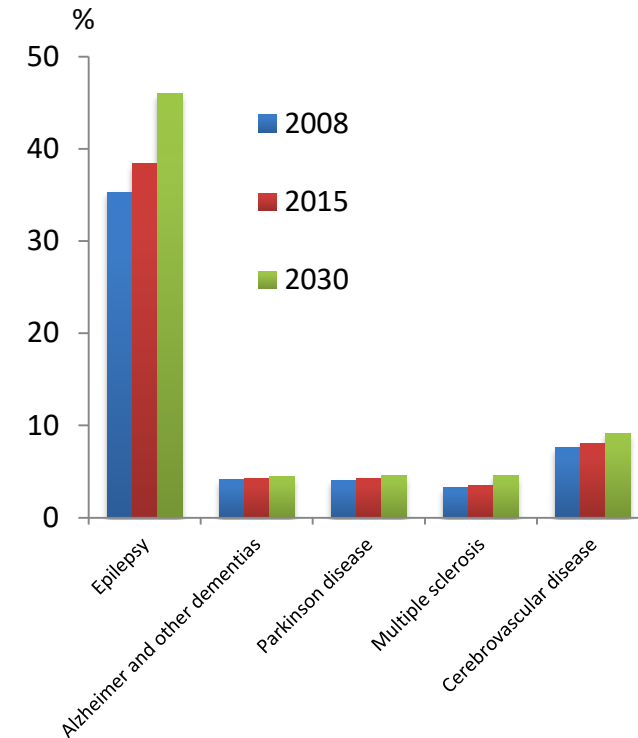
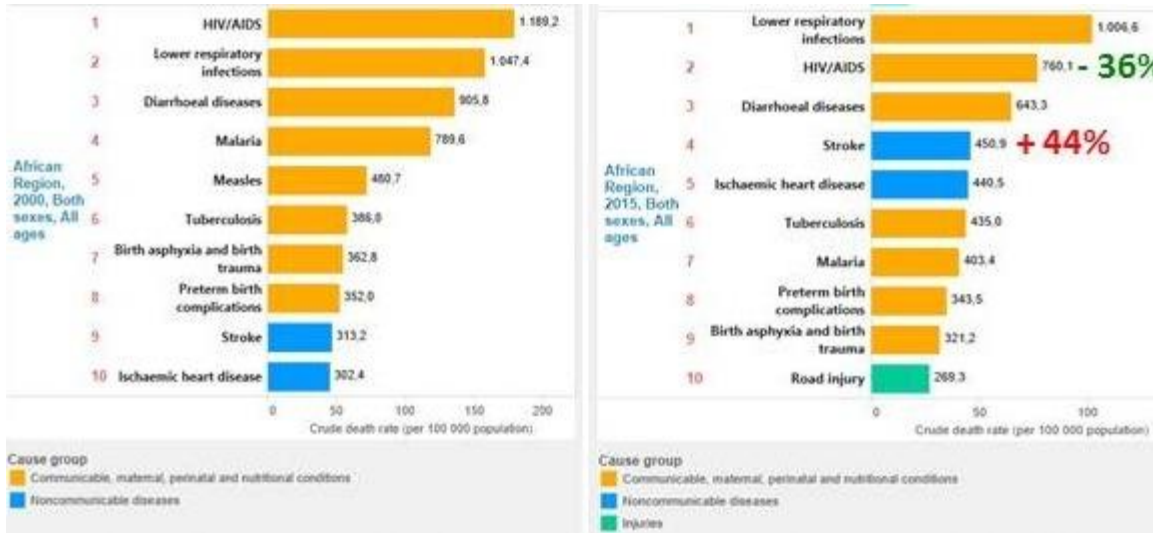
The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization
Map Production: Information, Evidence and Research (IER)
World Health Organization



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«Boom» delle malattie neurologiche in Africa



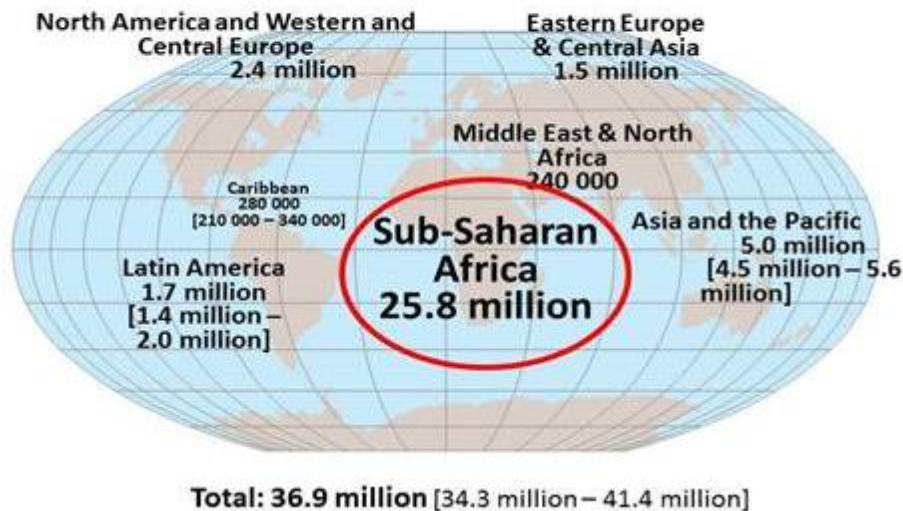
- In Africa le malattie neurologiche sono divenute la quarta causa di morte
- Uccidono più della malaria e della TBC
- Fra 10 anni faranno più vittime dell'AIDS (dati WHO)
- Quasi un decesso su due per epilessia avviene in Africa

http://www.who.int/gho/mortality_burden_disease/causes_death/top_10/en/

HIV

A risk factor for main neurologic disorders

Adults and children estimated to be living with HIV 2017



- Epilepsy
- Stroke
- Alzheimer
- Polyneuropathies

EDITORIAL

The merging burden of HIV infection and stroke in the developing world

Rita Behrouz, DO
Rebecca F. Gottesman,
MD, PhD

According to the WHO, at the end of 2014, the majority of the approximately 36.9 million people living with HIV/AIDS resided in low- to middle-income countries in sub-Saharan Africa.¹ The same report indicated that cases in sub-Saharan Africa account for almost 70% of the global total of new HIV infections.² The burden of stroke in developing countries parallels that of HIV/AIDS. Approximately 80% of people who have had a stroke live in low- to middle-income countries.³ Hypertension is another important risk factor, the authors point out the relative importance of these 2 major risk factors in this population, with the novel finding that hypertension is a more important risk factor than HIV in older Malawian adults. The increased risk of stroke in younger HIV-infected patients found by this study is consistent with prior reports.⁴

The study has limitations, especially with regard to generalizability. The investigation was conducted in

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Neurology® 2016;86:1873-1880

Neurologic disorders incidence in HIV+ vs HIV- men
Multicenter AIDS Cohort Study, 1996–2011

Farrak J. Mateen, MD*
Russell T. Shinohara,
PhD*
Marco Carone, PhD
Eric N. Miller, PhD
Justin C. McArthur,
MBBS, MPH, FAAN
Lisa P. Jacobson, ScD
Ned Sacktor, MD
For the Multicenter
AIDS Cohort Study
(MACS) Investigators

ABSTRACT

Objective: To study the incidence and pattern of neurologic disorders in a large cohort of HIV-positive men, compared with HIV-negative men, in the era of highly active antiretroviral therapy (HAART).

Methods: The Multicenter AIDS Cohort Study is a prospective study of men who have sex with men enrolled in 4 cities in the United States. We compared HIV-positive vs HIV-negative men for incidence and category of neurologic diagnoses in the HAART era (July 1, 1996, to last known follow-up or death, on or before July 1, 2011).

Results: There were 3,945 participants alive during the HAART era (2,083 HIV negative, 1,776 HIV positive, and 80 who became infected with HIV during the study period) including 3,427 who were older than 40 years of age. Median age at first neurologic diagnosis among all participants alive in the HAART era was lower in HAART-treated HIV-positive vs HIV-negative men (48 vs 57 years of age, $p < 0.001$). Incidence of neurologic diagnoses was higher in HAART-treated HIV-positive vs HIV-negative men (younger than 40 years: 11.4 vs 0 diagnoses per 1,000 person-years [$p < 0.001$]; 40–49 years: 11.6 vs 2.0 [$p < 0.001$]; 50–59 years: 15.1 vs 3.0 [$p < 0.001$]; older than 60 years: 1.7 vs 5.7 [$p < 0.01$]). Excess neurologic disease was found in the categories of nervous system infections ($p < 0.001$), dementia ($p < 0.001$), seizures/epilepsy ($p < 0.01$), and peripheral nervous system disorders ($p < 0.001$), but not stroke ($p = 0.60$).

Conclusions: HIV-positive men receiving HAART have a higher burden of neurologic disease than HIV-negative men and develop neurologic disease at younger ages. *Neurology*® 2012;79: 1873–1880

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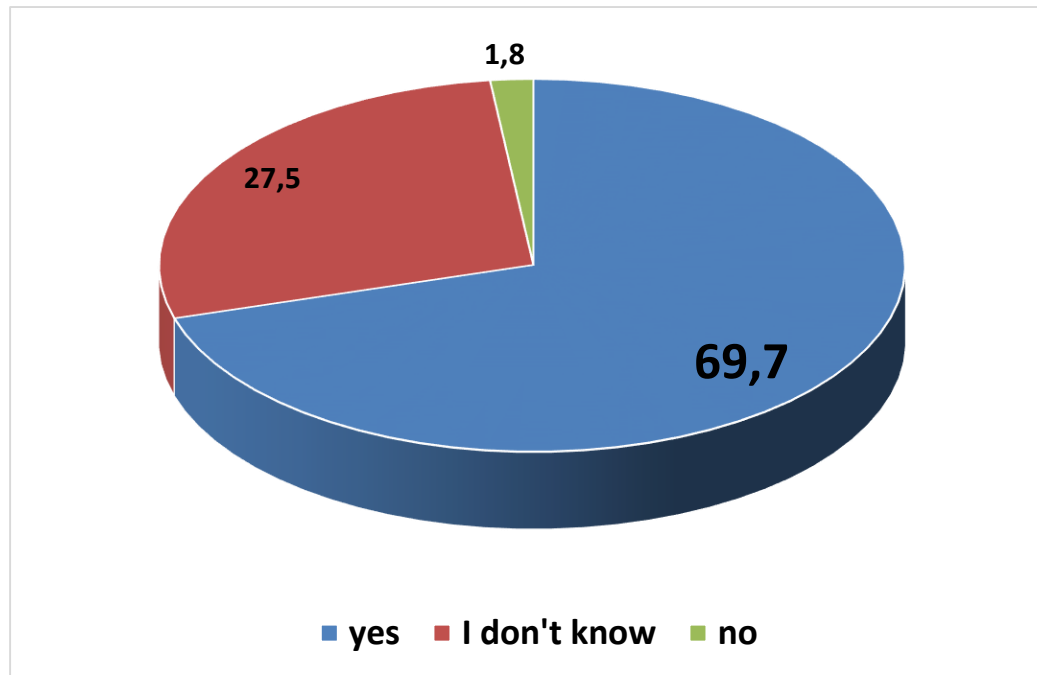
Gruppo di studio SIN paesi in via di sviluppo - Africa

- I disordini neurologici in Africa subsaariana sono di interesse per la neurologia italiana?

Gruppo di studio SIN paesi in via di sviluppo - Africa

109 giovani neurologi

«Ritieni che la crescente diffusione delle malattie non comunicabili e neurologiche in Africa subsaariana abbia un impatto anche sull'Italia e l'Europa?»





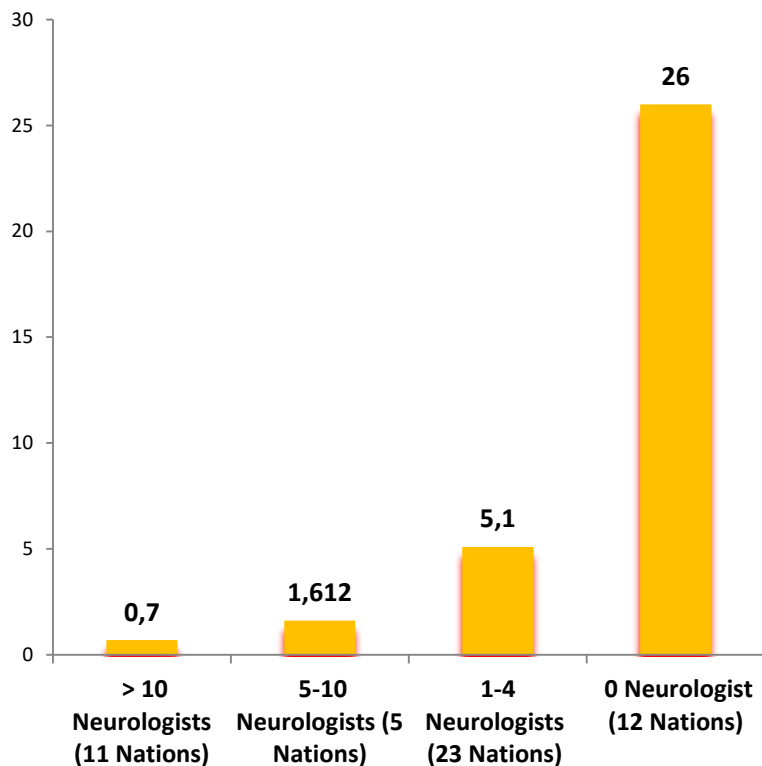
Malawi: > 80% vive in
aree rurali



I neurologi in Africa subsaariana sono uno ogni 3-5 milioni di abitanti

Neurologists in Africa - 51 nations

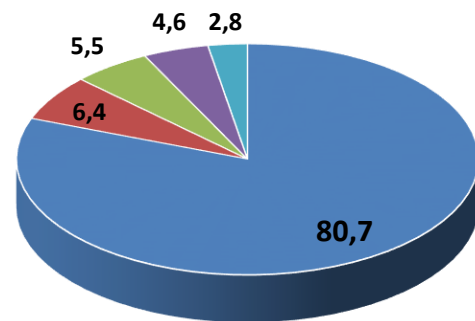
Millions population per neurologist



Bower and Zenebe. Neurology 2005;64:412-415

Chi intercetta il malato neurologico?

- Il medico di base?
- L'infettivologo?
- I clinical officers?
- Gli infermieri?
- I *local healers* (guaritori locali)?



■ local healers
■ general practitioner
■ clinical officers
■ nurses
■ infective disease specialist

Gestione di malattie neurologiche e formazione in Africa subsaariana

Quali modelli?

- I neurologi in Africa subsaariana sono uno ogni 3-5 milioni di abitanti:
- Con chi ci troveremmo ad interagire?
- In quali contesti?

Nuova demografia, quale neurologia

**Formazione in Neurologia \neq
Formare neurologi?**

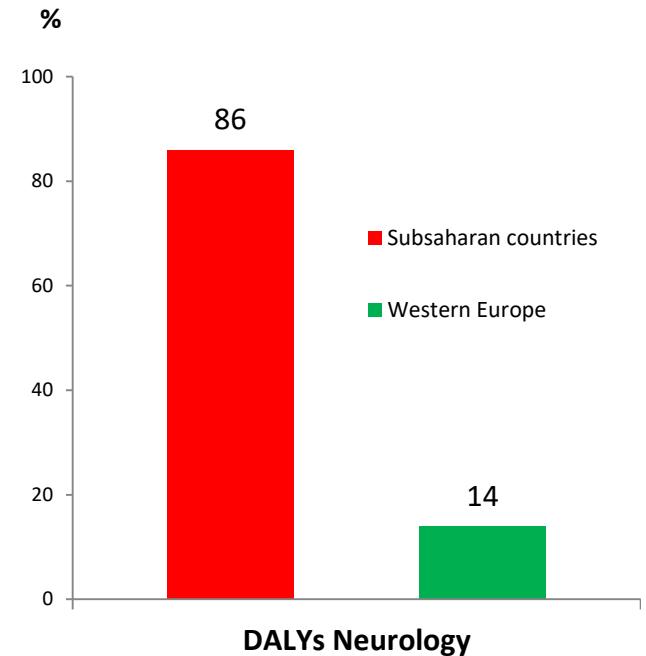
Chi formare?

Dove?

Quali priorità?

Tempistiche?

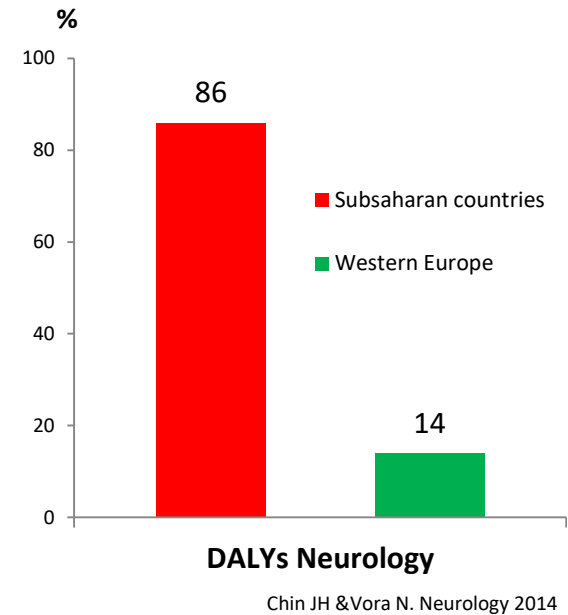
Obiettivi?



Nuova demografia, quale neurologia

Formazione

- Modello classico *top-top*
- Modello «leggero» *down-top?*
 - «*Unconventional*» *education in neurology*



Gestione malattie neurologiche (malattie croniche)

Cosa occorre

The Economist | Topics | Current edition | More

→ A crazy system: Nobody spends enough on mental health

First things first

The importance of primary care

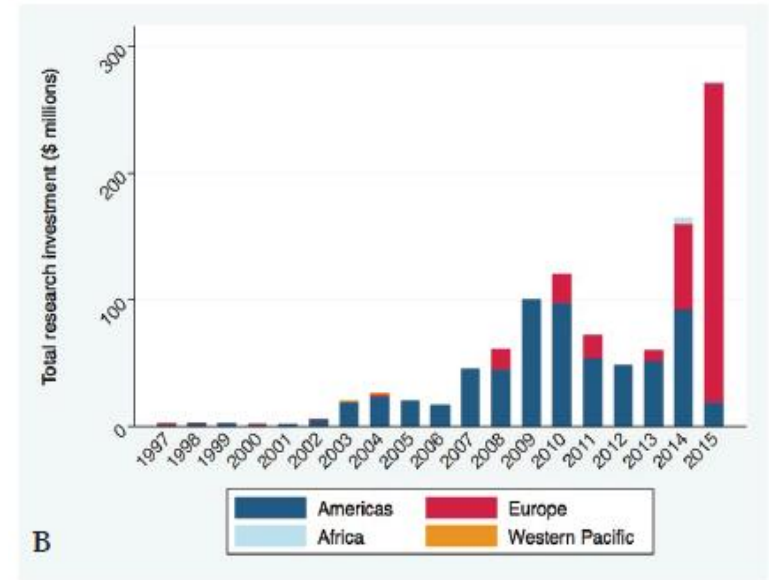
Good primary care is an essential precondition for a decent health-care system



Print edition | Special report > | Apr 26th 2018

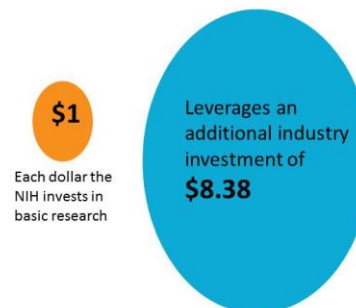
Twitter | Facebook | LinkedIn | Email | Print

In Africa: su cosa si investe



Fitchett JRA et al. J Global Health 2016; 6 (2): 1-10

US investments in global health R&D leverage private sector funding



Gestione di malattie croniche

Africa HIV/AIDS, primo «modello» di malattia cronica

Anni 2000

- Personale sanitario
- Strutture
- Cure d'eccellenza
- Retention
- Accessibilità
- Education e training del personale

Gestione di malattie croniche

Africa HIV/AIDS, primo «modello» di malattia cronica

2019

- **Personale sanitario**
- **Strutture**
- **Cure d'eccellenza**
- **Retention**
- **Accessibilità**
- **Education e training del personale**

Retention on antiretroviral therapy in sub-Saharan Africa

505,634 patients

Haas AD et al. *Journal of the International AIDS Society* 2018, 21:e25084
<http://onlinelibrary.wiley.com/doi/10.1002/jia2.25084/full> | <https://doi.org/10.1002/jia2.25084>

Table 2. Cumulative incidence of antiretroviral therapy outcomes

	Cumulative incidence of antiretroviral therapy outcomes (95% CI)			
	Recorded in clinic databases ^a	Adjusted with point estimate ^b	Adjusted with lower limits of CI ^b	Adjusted with upper limits of CI ^b
1 year				
Retained on ART	76.8 (76.7 to 77.0)	83.1 (83.0 to 83.2)	79.7 (79.6 to 79.8)	87.5 (87.4 to 87.6)
Lost to follow-up/stopped ART ^c	19.6 (19.5 to 19.7)	8.5 (8.5 to 8.6)	14.2 (14.1 to 14.2)	0.8 (0.8 to 0.8)
Died	3.5 (3.5 to 3.6)	8.4 (8.3 to 8.4)	6.2 (6.1 to 6.2)	11.7 (11.6 to 11.8)
2 years				
Retained on ART	68.8 (68.7 to 69.0)	77.3 (77.6 to 77.8)	72.9 (72.8 to 73.0)	84.1 (83.9 to 84.2)
Lost to follow-up/stopped ART ^c	26.7 (26.6 to 26.9)	11.7 (11.6 to 11.8)	19.3 (19.2 to 19.5)	1.1 (1.1 to 1.1)
Died	4.4 (4.4 to 4.5)	10.6 (10.5 to 10.7)	7.8 (7.7 to 7.8)	14.9 (14.8 to 15.0)
3 years				
Retained on ART	62.8 (62.7 to 63.0)	73.8 (73.7 to 73.9)	67.9 (67.7 to 68.0)	81.6 (81.5 to 81.8)
Lost to follow-up/stopped ART ^c	32.1 (32.0 to 32.3)	14.2 (14.1 to 14.3)	23.3 (23.2 to 23.4)	1.3 (1.3 to 1.4)
Died	5.0 (5.0 to 5.1)	12.1 (12.0 to 12.2)	8.8 (8.7 to 8.9)	17.0 (16.9 to 17.2)
4 years				
Retained on ART	57.5 (57.4 to 57.7)	70.2 (70.1 to 70.3)	63.3 (63.2 to 63.5)	79.5 (79.3 to 79.6)
Lost to follow-up/stopped ART ^c	36.9 (36.8 to 37.1)	16.4 (16.3 to 16.5)	26.9 (26.8 to 27.0)	1.5 (1.5 to 1.6)
Died	5.6 (5.5 to 5.6)	13.4 (13.3 to 13.5)	9.8 (9.7 to 9.9)	19.0 (18.8 to 19.1)
5 years				
Retained on ART	52.1 (51.9 to 52.3)	66.6 (66.4 to 68.8)	58.7 (58.5 to 58.9)	77.4 (77.2 to 77.5)
Lost to follow-up/stopped ART ^c	41.8 (41.6 to 42.0)	18.8 (18.6 to 18.9)	30.6 (30.4 to 30.8)	1.8 (1.7 to 1.8)
Died	6.0 (6.0 to 6.1)	14.7 (14.5 to 14.8)	10.6 (10.5 to 10.7)	20.8 (20.7 to 21.0)

Data are cumulative incidences of antiretroviral therapy outcomes (in %) and 95% confidence intervals for patients starting antiretroviral therapy. Time is measured in years from start of antiretroviral therapy.

^aCrude estimates show cumulative incidence of death, loss to follow-up and retention on ART as recorded in the clinic database.

^bAdjusted estimates correct for underreporting of mortality and transfer out based on the point estimates and 95% confidence intervals (CIs) for mortality (20.8%, 95% CI: 11.3 to 35.1%) and self-transfer (35.9%, 95% CI: 16.8 to 60.9%) among patients lost to follow-up. Adjustment parameters are derived from a meta-analysis of tracing studies [11].

^cIn the adjusted analyses patients alive but not retained on ART are assumed to have stopped ART.



General Assembly

Distr.: General
24 January 2012

Sixty-sixth session
Agenda item 117

Resolution adopted by the General Assembly

[without reference to a Main Committee (A/66/L.1)]

66/2. Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases

The General Assembly

Adopts the Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases annexed to the present resolution.

*3rd plenary meeting
19 September 2011*

Annex

Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases

27. Note with concern the possible linkages between non-communicable diseases and some communicable diseases, such as HIV/AIDS, call for the integration, as appropriate, of responses to HIV/AIDS and non-communicable diseases, and in this regard call for attention to be given to people living with HIV/AIDS, especially in countries with a high prevalence of HIV/AIDS, in accordance with national priorities;

Gestione di malattie croniche in Africa– Un modello italiano

- Since 2002
- In 11 nations:
 - **Mozambique**, Malawi, Tanzania, Kenya, Republic of Guinea, Swaziland, Cameroon, Congo RDC, Central African Republic, Angola and Nigeria
- 48 health centres plus 25 laboratories including molecular biology
- ≈500,000 HIV+ pts monitored with regular follow up including clinical monitoring, blood samples, education, prevention, communities involvement



HIV in 2000

Western and SSA health systems

Western countries

- Education and training **yes**
- Triple therapy: **yes**
- Viral load detection: **yes**
- ARV during pregnancy : **yes**
- Test and treat : **yes**
- Specialized centres: **yes**
- Drugs free: **yes**

Sub-Saharan Africa

- Education and training **no**
- Triple therapy: **no**
- Viral load detection: **no**
- ARV during pregnancy : **no**
- Test and treat : **no**
- Specialized centres: **no**
- Drugs free: **no**

HIV in 2000

Western and SSA health systems

Western countries

- Education and training **yes**
- Triple therapy: **yes**
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- Drugs free: **yes**

DREAM in Sub-Saharan Africa

- Education and training **yes**
- Triple therapy: **yes**
- Viral load detection: **yes**
- ARV during pregnancy : **yes**
- Test and treat : **yes**
- Specialized centres: **yes**
- Drugs free: **yes**

DREAM is education and training



- More than 10,000 african personnel: doctors, clinical officers, nurses, biologists, lab. technicians, coordinators, managers, health personal – home casre, counselling etc-, technicians for pc, networking, renewable energies. 28 Pan-African courses 2002–2016.

Modifies from Liotta et al. Int J Environ Res Public Health 2015; 12: 1324-39



The DREAM software

dream Comunità di Sant'Egidio

Archivio Connesso: Prova QG | Amministratore | IT

Paziente BA000747 XXX XXX

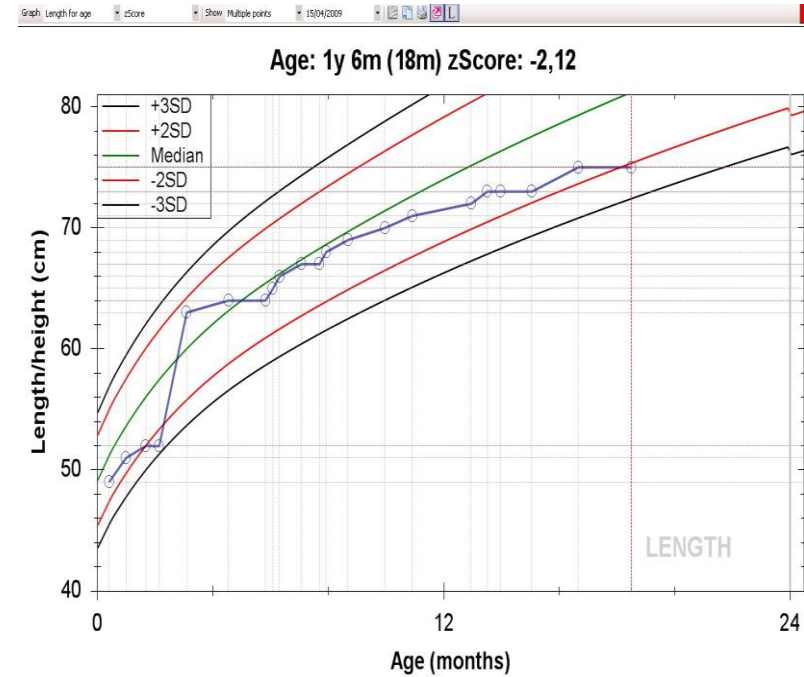
Età: 33 Anni | Servizio: MCPC | Assistenza: Day Hospital | Terapie: Terapija o prevenzione TBC, Terapija ARV, Integrazione alim.

Stadio AIDS: 1 | Seropositivo: Si | Tipo HIV: 1 | Integrazione Alimentare: NO

Dati personali: Nome: XXX, Cognome: XXX, Sesso: F, Data nascita: 24/06/1981, Indirizzo: Mularje, providence secondary school. Mrs bula.

Nucleo familiare: Madre, Padre, Fratelli e sorelle, Coniuge, Figli: BA000747P11 XXX XXX, BA000748 XXX XXX.

Assistenza: Inizio assistenza: 14/02/2008, Centro di riferimento: Balaka.



dream Comunità di Sant'Egidio

15.13 | 21/11/2016 | Database connected: BALAKA | Amministratore | EN

Age: 48 Years | Servizio: CCHC | Food integration: Food Integration NO

Blood tests:

Date	wBC	RBC	HGB	MCV	PLT	LYM	CD4	CD8	CD4%	CD8%	CD4/CD8	BDNA	PCR	ALT	AST	Creat	GRF	Glyc	Bld	Ba	Urea	Albumin	Iron	Detemese	Lingold	Di
30/06/2015	6	4.01	12.8	96	304	52.3							<40			0.52	106									
17/08/2015	7.6	4.21	13.2	95.5	319	43.7							<40	16	10	0.69	ND	93								
13/07/2015	6.1	4.19	13.3	96.4	296	49.9							<40	16	10	0.69	ND	93								
24/02/2015	5.4	4.1	12.6	95.9	336	59.4							<40	18	27											
29/06/2014	5.9	4.19	13.1	95	281	59.2	36						<40	21	23	0.54	ND	89	0.2	0.43		4.7	39			
13/03/2014	5.2	4.25	13.5	96.4	320	44.7	26						<40	21	23	0.54	ND	89	0.2	0.43		4.7	39			
14/06/2013	7.6	4.21	13.2	95.5	319	43.7							<40	21	23	0.54	ND	89	0.2	0.43		4.7	39			
18/03/2013	6.0	4.16	13	90.6	296	45.9	34						<40	24	29											
18/12/2012	6.6	4	12.9	98	300	51.9	799	29					<40	29	20											
21/09/2012	5.3	3.45	12.8	105.9	397	47.9	34						<40	13	17	0.47	ND		0.16	0.39		5.1	20			
17/07/2012	5.4	3.04	12.2	116.4	314	53.4							<40	26	30											
12/04/2012	4.5	2.91	11.7	115.8	363	67.8	29						<40	21	30	0.65	54.7	87	0.18	0.37		4.5	85			
13/12/2011	5.3	3.09	12.8	116.8	389	88.9							<40	24	24											
24/08/2011	4.4	3.29	13.9	116.1	227	70	29						<40	25	26	0.78	79.6	87	0.27		4.7	120				
17/05/2011	6	3.8	14.2	110.3	242	67.2							<40	25	26	0.78	79.6	87	0.27		4.7	120				
06/05/2011	6	3.44	13.4	109.9	230	69.3							<40	31	32											
24/02/2011	6	3.64	13.7	111	206	76.6	26						<40	31	32											
23/11/2010	5.9	3.45	13.1	109.3	247	53.6							<40	31	32											
09/05/2010	6.1	3.6	13.7	107.8	230	50.5							<40	15	25	0.67	89.4	90	0.26	0.41		4.9	87			
07/12/2009	5.3	3.31	13.1	110.6	205	46.9	883	36					<40	17	21	0.75	81.5	98	0.51	0.83		4.8	95			
02/06/2009	5.5	3.42	13.5	112.3	219	50.5	862	24					<40	15	25	0.72	ND	27	0.27	0.42		5	35			
09/12/2008	5.6	3.34	13.2	111.7	211	55.4	814	25					<40	17	24											

Prescriptions:

Prescription	Appointment	Sample Date	Status	Sending date
27/11/2016	16/12/2016		Waiting for sample	

DREAM laboratories



Retention in DREAM

ORIGINAL RESEARCH

Who will be lost? Identifying patients at risk of loss to follow-up in Malawi. The DREAM Program Experience

S Mancinelli,¹ K Nielsen-Saines,² P Germano,³ G Guidotti,³ E Buonomo,¹ P Scarcella,¹ R Lunghi,⁴ H Sangare,⁴ S Orlando,³ G Liotta,¹ MC Marazzi⁵ and L Palombi¹

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Objectives

Retention of subjects in HIV treatment programmes is crucial for the success of treatment. We evaluated retention/loss to follow-up (LTFU) in subjects receiving established care in Malawi.

Methods

Data for HIV-positive patients registered in Drug Resource Enhancement Against AIDS and Malnutrition centres in Malawi prior to 2014 were reviewed. Visits entailing HIV testing/counselling, laboratory evaluations, nutritional evaluation/supplementation, community support, peer education, and antiretroviral (ART) monitoring/pharmacy were noted. LTFU was defined as > 90 days without an encounter. Parameters potentially associated with LTFU were explored, with univariate/multivariate logistic regression analyses being performed.

Results

Fifteen thousand and ninety-nine patients registered before 2014; 202 (1.3%) were lost to follow-up (LTFU) (1.3%). Nine (0.5%) of 1744 paediatric patients were LTFU vs. 1.4% ($n = 193$) of 13 355 adults ($P < 0.001$). Subjects who were LTFU had fewer days in care than retained subjects (1338 vs. 1544, respectively; $P < 0.001$) and a longer duration of ART (1530 vs. 1300 days, respectively; $P < 0.001$). Subjects who were LTFU had higher baseline HIV viral loads ($P = 0.016$) and higher body mass indexes ($P < 0.001$), were more likely to live in urban settings (88% of patients who were LTFU lived in urban settings) with better housing [relative risk (RR) 2.3; 95% confidence interval (CI) 1.67–3.09; $P < 0.001$], and were more likely to be educated (RR 1.88; 95% CI 1.42–2.50; $P < 0.001$). Distance to the centre and cost of transportation were associated with LTFU (RR 3.4; 95% CI 2.84–5.37; $P < 0.001$), as was absence of a maternal figure (RR 1.57; 95% CI 1.17–2.09; $P < 0.001$). Viral load, distance index, education and a maternal figure were predictive of LTFU.

Conclusions

Educated, urbanized HIV-infected adults living far from programme centres are at high risk of LTFU, particularly if there is no maternal figure in the household. These variables must be taken into consideration when developing retention strategies.

Keywords: HIV, loss to follow-up, Malawi, predictors, retention

Accepted 17 November 2016

DREAM, a cost-effective model

Medicine®

ECONOMIC EVALUATION STUDY

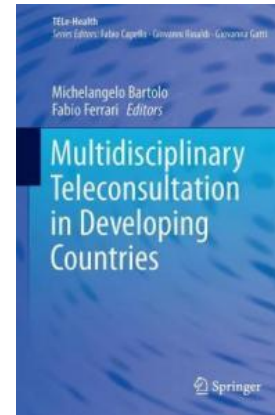
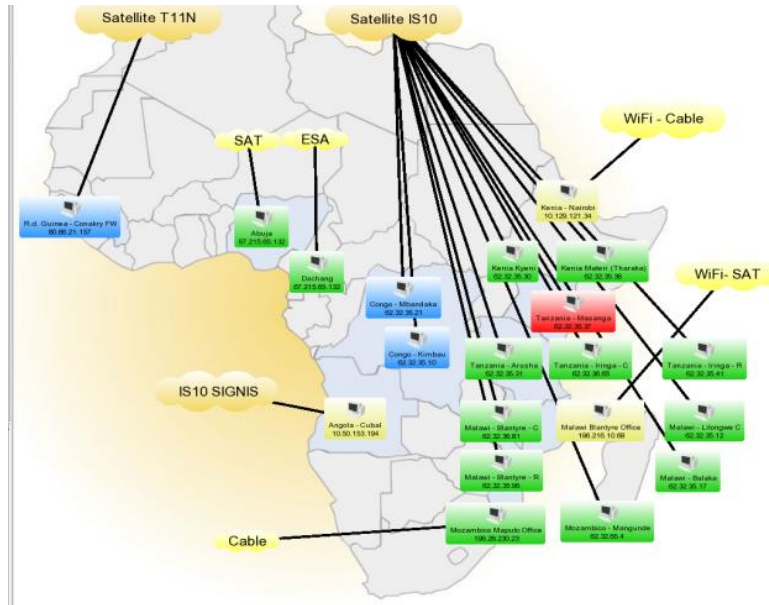
OPEN

Cost-Effectiveness and Quality of Care of a Comprehensive ART Program in Malawi

*Stefano Orlando, PhD, Samantha Diamond, MPH, Leonardo Palombi, MD,
Maaya Sundaram, BS, MPA, Lauren Shear Zinner, M. Eng, Maria Cristina Marazzi, MD,
Sandro Mancinelli, MD, and Giuseppe Liotta, MD*

- DREAM vs Malawi Ministry Health Program
- After 5 years
 - Costs per patient per year: 223,1 vs 136 USD
 - Living patients 79,8% vs 60%
 - DREAM
 - Income per patient/year : 1° year 64,65 – 5° year 606,89USD

DREAM and telemedicine



Journal of the Neurological Sciences 391 (2018) 109–111

Contents lists available at ScienceDirect

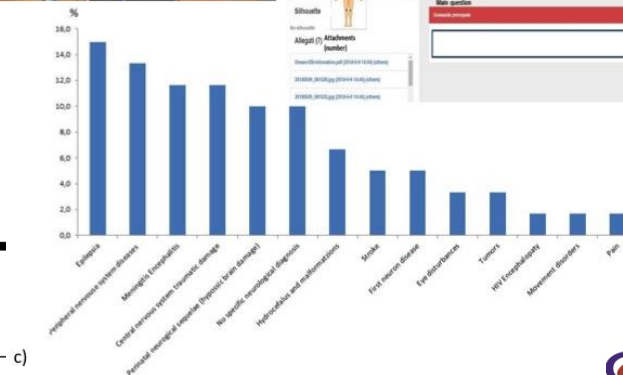
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Letter to the Editor

Teleneurology in sub-Saharan Africa: Experience from a long lasting HIV/AIDS health program (DREAM)



DREAM and sustainability

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Energy for Life: Electrical Wiring and Renewable Energy
Plant Design for Small-Scale Health Facilities in Africa

Giorgio Barbaglia

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Fig. 14.3 AROS SPS hybrid solar inverters powering DREAM center and laboratory. Balaka,

14 Plant for Africa and Renewable Energy

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Fig. 14.15 Installing a hybrid solar power system at the DREAM center and laboratory. Mhengo wa Ntenga (Lilongwe) Malawi



Fig. 14.2 Solar plant on DREAM center. Balaka, Malawi

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G. Barbaglia

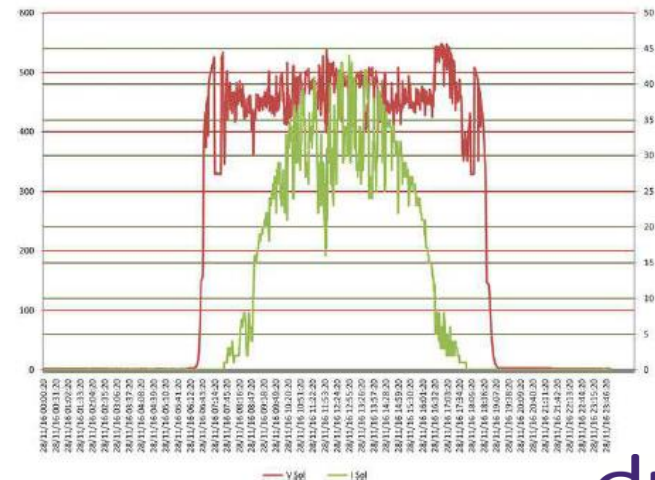
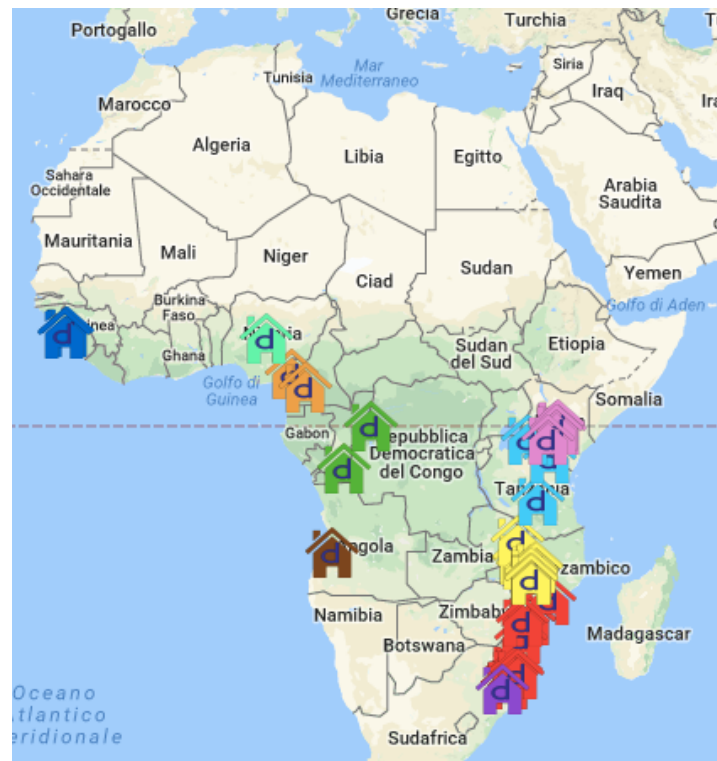


Fig. 14.13 Photovoltaic voltage (V) and current (A) on a 24-h basis

Disease Relief through Excellent and Advanced Means

- Modello extra-ospedaliero per la gestione delle malattie croniche e non comunicabili



Epilepsy, changes in behavior and mental illness



Improving epilepsy in sub-Saharan countries

The need to improve culture




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Mental health

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International Epilepsy Day



Leigh Lacobucci
Health nurse, Ghana

9 February 2018 - International Epilepsy Day, on 12 February, is an opportunity to raise awareness of epilepsy, what it is, how it can be treated, and what is needed to bring treatment to all people who need it.

The ability of health workers to diagnose epilepsy, the availability of medicines and research into the health and social care response to epilepsy are just three areas of action for WHO and partners.

[For more information on epilepsy International Epilepsy Day](#)

Highlights International Epilepsy Day Treating and defeating epilepsy in Ghana WHO Information Kit on Epilepsy: What you can do

www.who.int/news-room

Africa subsaariana

STROKE

- Percorso formativo per la prevenzione
- Ipertensione arteriosa (uccide 4 volte di più in Africa che altrove)
 - Diagnosi
 - Misurazione della pressione arteriosa a tutti (in Africa il 50% della popolazione non ne ha accesso)
 - ECG e valutazione cardiologica. Telemedicina!
 - Biomorali di base, glicemia, elettroliti, funzione renale, esame urine, profilo lipidico etc
 - Educazione stile di vita: fumo, alcool, **peso**, sedentarietà, carica virale virus HIV, altri fattori di rischio
 - Garantire i farmaci per l'ipertensione arteriosa, il **diabete** etc
 - Ridurre il carico ospedaliero: rete territorio - ospedale
 - Retention dei pazienti

Riunione fondativa del Gruppo di Studio
della Società Italiana di Neurologia

Società Italiana di Neurologia e paesi in via di sviluppo

Milano, 20 marzo 2019
Istituto Neurologico Besta, Biblioteca Centrale



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