Impact of Nepal earthquake on ART adherence, ART resistance, mental health problems and social issues among people living with HIV in earthquake-affected area in Nepal: a longitudinal study.

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Earthquake in Nepal

- A 7.8 magnitude earthquake in Nepal on 25 April 2015 resulted in

- Death : >8,600 people
- Displaced : >88,000
- Injury : >21,900
- Health facilities damage: 1085 (402 were completely destroyed)
- Houses destroyed : 500717

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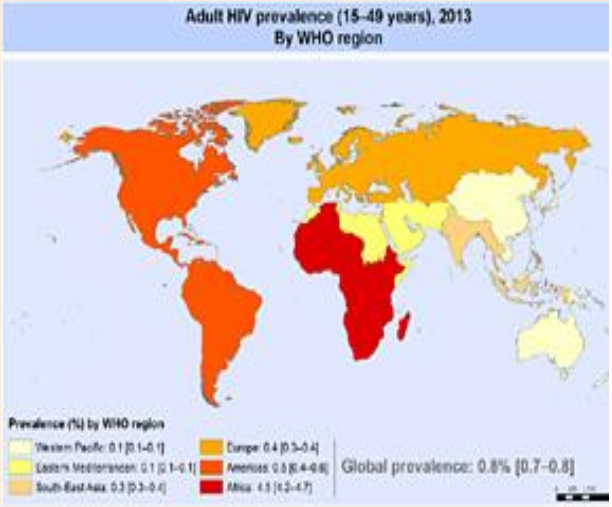
HIV/AIDS: Global Scenario

- ~36.7 million PLHIV
- 0.8% of total adult age
- 1 in 20 adults in Sub-Saharan Africa
- 35 million already died of HIV



(Source: WHO Global Health Observatory data)

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HIV situation in Nepal

- Around 25 thousand reported case of HIV+ve
- Sex workers, injecting drugs, MSM and returnee migrants are the major sources of HIV infection
- ~11 thousands PLHIVs are taking ART from 61 ART Centers
- ART Drug resistance situation is unknown
- Stigma and discrimination toward PLHIV is still big problem

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HIV/AIDS in disastrous situation

- Disaster survivors often go through psychological stress (Chen, 2014)
- Health service disruption following disaster often occurs due to facility damage, population movements, limited resources, and lack of preparedness (Chapin et al., 2009)
- After earthquake in Haiti, a marked decline in HIV testing and new enrolment was reported. (Walldorf, 2012)
- >95% Antiretroviral Therapy (ART) adherence needed to control HIV related health complications
- Interruption of ART can result in therapeutic failure and drug resistance (Harrigan, 2005 and Hogg, 2002)

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Objectives of this study

1) to assess the association of ART adherence with PTSD, stigma, HIV status disclosure, and social support under post-disaster conditions,

2) to investigate treatment failure and HIV Drug resistance, and

3) to examine changes in ART adherence and PTSD among PLHIV at 6 and 12 months after the disaster

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Method and Materials

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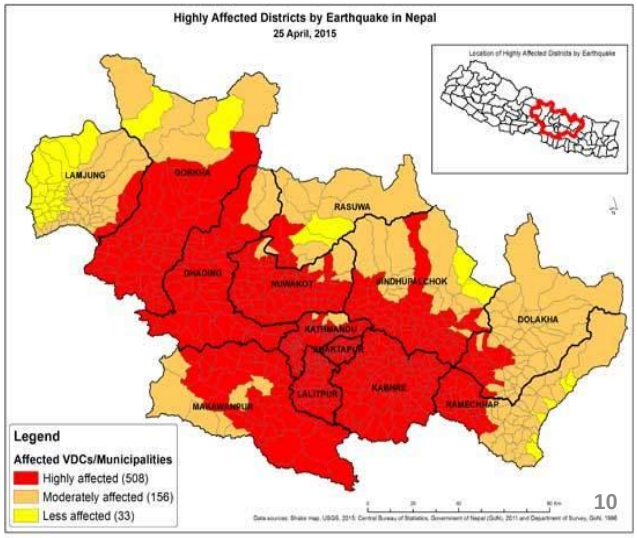
Place and participants

- 14 earthquake affected districts
- 10 out of 12 ART centres
- Participants PLHIVs on ART
- Sample size 300 (305 were interviewed
- Proportionate sampling
- Convenient sampling; random sampling was not feasible
- 40 blood samples were collected from treatment failure patients



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Variables measured

1. **Adherence to ART**: (AACTG scale)
2. **Antiretroviral Drug Resistance** (ADR): Blood genotypic laboratory analysis
3. **Posttraumatic stress disorder** (PTSD): The 17-item (Cronbach's alpha=0.90)
4. **Perceived Family Support**: 10-item (Cronbach's alpha=0.87)
5. **HIV stigma**: 4-item scale (Choronbach's alpha=0.83)
6. **Risky sexual behaviour**
7. **Treatment failure**
8. **Socio-economic factors**: based on NDHS 2011

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Analysis

- Logistic regression was used to measure association of adherence to ART and treatment failure with other predictors
- Chi Square test and fisher's Exact test for general description
- HIV-1 genomic fragments were amplified to identify drug resistance mutations (DRMs) according to the guidelines of the International Antiviral Society

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Results

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Table 1. Characteristics of study participants (N=305)

		Female n (%)	Male n (%)	Total n (%)	*p*-value
Age					
	40 and younger	84 (66.1)	93 (52.2)	177 (58.0)	**0.021**
	>40	43 (33.9)	85 (47.8)	**128 (42.0)**	
Married status					
	Unmarried	4 (3.1)	31 (17.4)	35 (11.5)	**<0.001**[a]
	Divorced/Widowed	50 (39.4)	13 (7.3)	63 (20.7)	
	Married	73 (57.5)	134 (75.3)	207 (67.9)	
Education					
	Illiterate	40 (31.5)	21 (11.8)	**61 (20.0)**	**<0.001**
	Primary	49 (38.6)	55 (30.9)	104 (34.1)	
	Secondary & above	38 (29.9)	102 (57.3)	140 (45.9)	
Loss of a family member in the earthquake					
	No	119 (93.7)	170 (95.5)	289 (94.8)	0.663
	Yes	8 (6.3)	8 (4.5)	**16 (5.2)**	
Stigma					
	No	60 (47.2)	93 (52.2)	153 (50.2)	0.456
	Yes	67 (52.8)	85 (47.8)	152 (49.8)	
HIV disclosure					
	Yes	125 (98.4)	169 (94.9)	294 (96.4)	0.195[a]
	No	2 (1.6)	9 (5.1)	**11 (3.6)**	
PTSD					
	No	55 (43.3)	116 (65.2)	171 (56.1)	**<0.001**
	Medium	43 (33.9)	50 (28.1)	**93 (30.5)**	
	High	29 (22.8)	12 (6.7)	**41 (13.4)**	
Support					
	Low	62 (48.8)	53 (29.8)	115 (37.7)	**<0.001**
	Medium	47 (37.0)	69 (38.8)	116 (38.0)	
	High	18 (14.2)	56 (31.5)	74 (24.3)	
Treatment failure					
	No	113 (89.0)	153 (86.0)	266 (87.2)	0.545
	Yes	14 (11.0)	25 (14.0)	**39 (12.8)**	
Adherence to ART					
	<95%	11(8.7)	13(7.3)	**24(7.9)**	0.827
	>95%	116(91.3)	165(92.7)	281(92.1)	
Border blockade effect					
	No	117 (92.1)	167 (93.8)	284 (93.1)	0.729
	Yes	10 (7.9)	11 (6.2)	21 (6.9)	

[a]Fisher's Exact Test

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Table 2. Factors associated with suboptimal adherence (4-day missed dose count) (N=305)

Variables		AOR 95% CI (Lower - Upper)	*p*-value
Sex			
	Female		
	Male	0.9 (0.21 - 3.67)	0.868
Age			
	40 and younger		
	>40	0.3 (0.08 - 0.95)	**0.042**
Religion			
	Hindu		
	Buddhist	0.6 (0.15 - 2.66)	0.526
	Christian or others	0.2 (0.03 - 0.97)	**0.047**
Area of residence			
	Rural		
	Urban	0.1 (0.02 - 0.43)	**0.002**
Lost a family member in the earthquake			
	No		
	Yes	1.7 (0.14 - 19.52)	0.688
Disclosure			
	Yes		
	No	0.1 (0.01 - 0.19)	**0.001**
Support			
	Low		
	Medium	0.3 (0.07 - 1.17)	0.08
	High	0.4 (0.06 - 2.36)	0.296
PTSD			
	No		
	Medium	2.9 (0.64 - 12.68)	0.167
	High	0.2 (0.04 - 0.91)	**0.038**
Stigma			
	No		
	Yes	0.6 (0.15 - 2.19)	0.411
Border blockade effect			
	No		
	Yes	0.2 (0.04 - 0.94)	**0.042**

AOR: Adjusted odds ratio; CI: Confidence Interval

Adjusted for marital status, family size, education, income, alcohol use, substance abuse, loss of house in earthquake and hospital stay

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Table 3. Factors associated with treatment failure (N=305)

Variables		AOR	95% CI (Lower - Upper)	*p*-value
Sex				
	Female			
	Male	2.4	(0.82 - 6.69)	0.109
Age				
	40 and younger			
	>40	0.9	(0.38 - 2.00)	0.76
Religion				
	Hindu			
	Buddhist	0.9	(0.28 - 2.66)	0.799
	Christian or others	4	(1.22 - 13.17)	**0.022**
Lost a family member in the earthquake				
	No			
	Yes	1.6	(0.31 - 8.66)	0.556
Disclosure				
	Yes			
	No	0.2	(0.01 - 2.23)	0.178
Support				
	Low			
	Medium	0.5	(0.20 - 1.45)	0.224
	High	1.4	(0.48 - 3.84)	0.557
PTSD				
	No			
	Medium	1	(0.41 - 2.38)	0.993
	High	0.9	(0.24 - 3.22)	0.851
Stigma				
	No			
	Yes	3.2	(1.29 - 7.76)	**0.012**

AOR: Adjusted odds ratio; CI: Confidence Interval

Adjusted for marital status, family size, education, income, area of residence, alcohol use, substance abuse, lost house in earthquake, border blockade effect and hospital stay

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Table 4. Major drug resistance-associated mutations and ART drugs

ID	Drug Resistance Major Mutations[a]			
	PI	nNRTI	NRTI	Resistant drugs
NP31	I50V		M41L	Darunavir, Fosamprenavir, Stavudine, Zidovudine
NP9			M184V	Abacavir, Emtricitabine, Lamivudine
NP18		Y188L,	M184V, D67N, L210W, T215Y	Abacavir, Emtricitabine, Lamivudine, Stavudine, Zidovudine, Efavirenz, Nevirapine, Rilpivirine
NP19		Y188L	M184V	Abacavir, Emtricitabine, Lamivudine, Efavirenz, Nevirapine, Rilpivirine
NP35		Y181C	M184V	Abacavir, Emtricitabine, Lamivudine, Efavirenz, Nevirapine, Rilpivirine, Etravirine
NP16		E138K		Rilpivirine
NP27		E138A		Rilpivirine

[a]Drug resistance mutations were based on guidelines published by IAS-USA

PI; Protease inhibitors; NRTI, Nucleoside Reverse Transcriptase; nNRTI, Non-Nucleoside Reverse Transcriptase Inhibitors

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Changes in adherence and PTSD level among PLHVs

Table 5 Changes in PTSD and Adherence to ART (N=210)

	Paired Differences	Std. Deviation	Std. Error Mean	95% Confidence Interval		t	df	*p*-value
	Mean			Lower	Upper			
PTSD 6 – PTSD 12	8.23	12.88	0.90	6.46	9.99	9.19	206	**<0.001**
Adherence 6 - Adherence 12	-0.06	0.25	0.02	-0.09	-0.02	-3.28	209	**0.001**

PTSD6: PTSD level after 6 months of earthquake; PTSD12: PTSD level after 12 months of earthquake; Adherence 6: adherence level after 6 months of earthquake; Adherence 12: adherence level after 12 months of earthquake

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Discussion and Conclusions

- PTSD and disclosure of the HIV status associated with adherence to ART, while HIV stigma and religion were associated with treatment failure
- PTSD and adherence levels to ART were improved significantly over the 6-month period
- Appearance of a very high rate of DRMs posed a threat to PLHIV residing in the earthquake-affected area
- Programs such as awareness to eliminate stigma and psychosocial counseling, to reduce PTSD may contribute to increase ART adherence and reduce drug resistance

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Thank you so much for your attention!

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