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Who are They? Identifying Risk Factors of Loss to Follow up Among HIV+ Patients on Care and Treatment in Dar es Salaam, Tanzania

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MDH MANAGEMENT AND DEVELOPMENT FOR HEALTH

Management and Development for Health

Introduction

- Management and Development for Health (MDH) supports care and treatment in Dar es Salaam City
- Biggest city in Tanzania, with 3 administrative districts: Ilala, Kinondoni, Temeke
- Estimated population >4 million

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Dar es Salaam

- Care and treatment program officially started in 2004 under PEPFAR support
- To date MDH supports more than 95 facilities in the city
- Has cumulatively enrolled >150,000 patients on care and treatment
- More than 70,000 are actively engaged in care
- HIV prevalence*
  - Tanzania: 5.1%
  - Dar es Salaam: 6.9%

*THMIS 2011/2012

Patient Retention

- MDH in collaboration with CHMTs has worked to improve retention among patients enrolled in care and treatment
- Significant improvements has been noted but not to expected level (75%)
- Current retention rate: 67%
- Call for a need to research on new retention strategies
- Understanding risks associated with LTFU is key to strengthening retention strategies

Study Objectives

- To identify predictors of loss to follow up among patients on ART and those on care and monitoring
- To inform care and treatment program on areas that needs improvement as far as retention of patients is concerned

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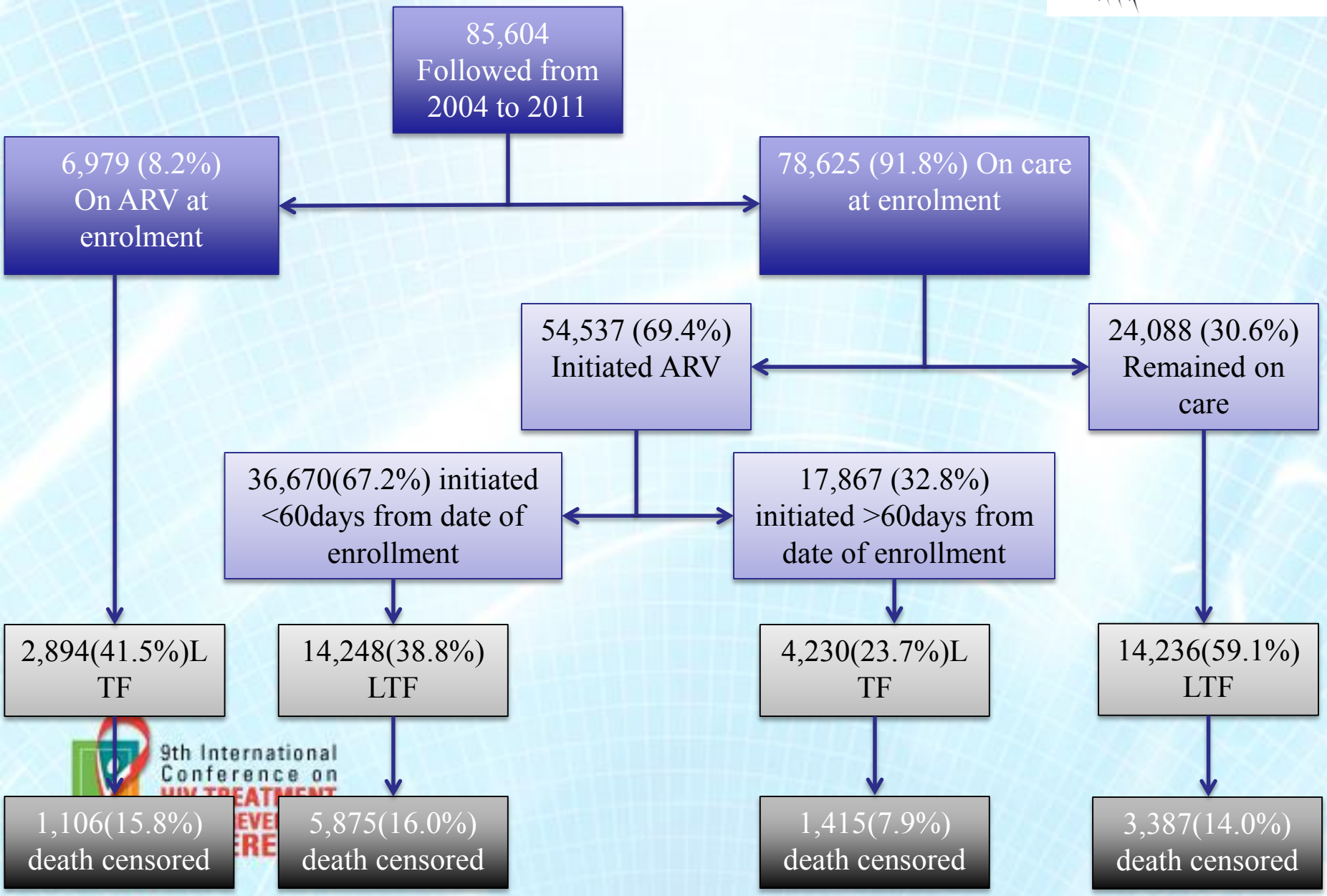
Methodology

- We analyzed data for a cohort of patients from 2004 to 2011
- LTFU was defined as:
  - missing clinic visit for 90 consecutive days after the last scheduled appointment date among patients on ART
  - missing clinic visit for 180 consecutive days after the last scheduled appointment date among patients on care and monitoring

Methodology

- Data were analyzed using SAS version 9.3
- For univariate and multivariate analysis, Cox proportional hazard regression model was employed to identify the risk factors.
- Variables with p value ≤0.2 in univariate analysis were included in the multivariate model
- Kaplan Meier plots were used to determine the rate of loss to follow up

Flow chart



Results

- Among 85,608 patients followed, most of them were on antiretroviral therapy (ART).
- The median age of study participants was 34 (IQR: 29- 41 years)
- The median CD4+ cell count was 206 cells/ L (IQR: 84-378 cells/μL).

Table 1: Basic Characteristics at Enrollment

Variable	N	Percentage (%)
Sex		
Male	24,274	28.4
Female	61,330	71.6
Age:		
<30	54,169	63.2
30 - <40	18,313	21.4
40 - <50	8,926	10.4
50+	4,196	4.9
WHO stage:		
I	18,046	22.0
II	15,448	18.8
III	33,809	41.2
IV	14,760	18.0
TB History		
No	62,656	79.0
Yes	16,807	21.0

Table 1: Basic Characteristics at Enrollment

Variable	N	Percentage (%)
CD4:		
<100	12,669	14.8
100 - <200	14,218	16.6
200 - <350	17,587	20.5
350+	41,130	48.1
District		
Ilala	34,956	41.1
Kinondoni	28,294	33.2
Temeke	21,869	25.7
Year		
2004 & 2005	6,650	7.8
2006	10,113	11.8
2007	14,314	16.7
2008	16,563	19.4
2009	16,008	18.7
2010	13,896	16.2
2011	8,060	9.4

Results

- For those on ART, it was found that patients aged ≥50 years and those with CD4+ cell count <100 cells/ L had an independent significantly increased risk of loss to follow up (RR: 1.11, 95% CI 1.03 – 1.19, p< 0.0001 and RR: 1.22, 95% CI 1.10 – 1.24, p=0.01 respectively).

Univariate and Multivariate for LTFU for Patients on ART (N =31,637)

Variable	Univariate RR (95% CI)	P for Trend	Multivariate RR (95% CI)	P for Trend
Age:		<0.0001		<0.0001
<30	0.08 (0.07 – 0.08)		0.06 (0.06 – 0.07)	
30 - <40	Reference		Reference	
40 - <50	1.03 (0.98 – 1.09)		1.07 (1.01 – 1.13)	
50+	1.13 (1.06 – 1.22)		1.11 (1.03 – 1.19)	
WHO stage:		<0.0001		0.5
I	Reference		Reference	
II	0.99(0.91– 1.07)		0.79(0.73 – 0.85)	
III	1.25(1.20 – 1.31)		0.84 (0.79 – 0.90)	
IV	1.50(1.40 – 1.62)		0.99(0.92 – 1.07)	
TB History		0.05		<0.0001
No	Reference		Reference	
Yes	1.03(1.00 – 1.07)		0.85 (0.81 – 0.90)	

Univariate and Multivariate for LTFU for Patients on ART (N =31,637)

Variable	Univariate RR (95% CI)	P for Trend	Multivariate RR (95% CI)	P for Trend
CD4:		<0.0001		0.01
<100	1.50 (1.42 – 1.57)		1.22 (1.10 – 1.24)	
100 - <200	1.46 (1.38 – 1.54)		1.15 (1.08 – 1.21)	
200 - <350	1.27 (1.20 – 1.34)		1.04 (0.98 – 1.10)	
350+	Reference		Reference	
District		0.001		<0.0001
Ilala	Reference		Reference	
Kinondoni	1.36 (1.31 –1.40)		1.19 (1.13 –1.25)	
Temeke	1.29 (1.24 –1.33)		1.27 (1.20 –1.34)	
Year		<0.0001		<0.0001
2004 & 2005	Reference		Reference	
2006	1.02 (0.93 –1.11)		1.18 (1.07 –1.30)	
2007	1.09 (1.01 –1.18)		1.54 (1.41–1.68)	
2008	1.23 (1.14 – 1.33)		2.90 (2.65 – 3.18)	
2009	1.25 (1.16 – 1.35)		3.51 (3.19 – 3.85)	
2010	1.04 (0.95 – 1.14)		3.78 (3.40 – 4.21)	
2011	0.26 (0.21 – 0.31)		1.73 (1.39 – 2.15)	

Results

- Among patients on care and monitoring male patients, patients with advanced disease and lower CD4 cell count were found to have significantly increased risk with (RR: 1.06, 95% CI 1.01 – 1.14, p< 0.04), (RR: 1.26, 95% CI 1.14 – 1.39, p< 0.0001) and (RR: 2.10, 95% CI 2.07 – 2.22, p< 0.0001) respectively

Univariate and Multivariate for LTFU for Patients on Care and Monitoring (N = 36504 patients with 13,371 events (36.6%))

Variable	Univariate RR (95% CI)	P for Trend	Multivariate RR (95% CI)	P for Trend
Sex				
Male	1.26 (1.20 – 1.33)	<0.0001	1.06 (1.01 – 1.14)	0.04
Female	Reference		Reference	
Age		<0.0001		0.1
<30	0.35 (0.33 – 0.36)		0.42 (0.40 – 0.45)	
30 - <40	Reference		Reference	
40 - <50	1.04 (0.97 – 1.12)		1.04 (0.97 – 1.12)	
50+	1.09 (0.99 – 1.20)		1.09 (0.99 – 1.20)	
WHO stage:		<0.0001		<0.0001
I	Reference		Reference	
II	1.04 (0.99 – 1.09)		0.96 (0.91 – 1.02)	
III	1.73 (1.66 – 1.81)		1.18 (1.11 – 1.26)	
IV	2.61 (2.48 – 2.75)		1.26 (1.14 – 1.39)	

Univariate and Multivariate for LTFU for Patients on Care and Monitoring (N = 36504 patients with 13,371 events (36.6%))

Variable	Univariate RR (95% CI)	P for Trend	Multivariate RR (95% CI)	P for Trend
CD4:		<0.0001		<0.0001
<100	2.60 (2.53 – 2.65)		2.10 (2.07 – 2.22)	
100 - <200	2.50 (2.32 – 2.69)		1.81 (1.67 – 1.97)	
200 - <350	1.30 (1.23 – 1.86)		1.26 (1.20 – 1.33)	
350+	Reference		Reference	
District		0.001		0.2
Ilala	Reference		Reference	
Kinondoni	1.35 (1.29 –1.42)		1.26 (1.20 –1.33)	
Temeke	1.03 (0.97 –1.09)		1.00 (0.94 –1.06)	
Year		<0.0001		<0.0001
2004 & 2005	Reference		Reference	
2006	1.03 (0.93 –1.13)		1.20 (1.08 –1.34)	
2007	1.00 (0.92 –1.09)		1.35 (1.22 –1.48)	
2008	0.99 (0.91 – 1.08)		1.55 (1.41– 1.71)	
2009	0.91 (0.84 – 0.99)		1.50 (1.35 – 1.66)	
2010	0.50 (0.45 – 0.56)		0.89 (0.79 – 1.00)	
2011	0.01 (0.01– 0.02)		0.02 (0.01 – 0.04)	

Conclusions

- Patients on care and monitoring are more likely to be lost than patients on ART
- Patients with low CD4, advanced disease, old age have high mortality rates
- The high correlation of low CD4 and older age are suggestive of LTFU from undetected deaths

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Conclusions

- Determining risk of LTFU at enrollment and initiation of ART and active and focused tracking are crucial to improve retention rates both for patients on ART and care and monitoring
- Strengthening access and immediate tracking of patients on care and monitoring is recommended to improve patient outcomes, detection and documenting deaths.

Disclosures

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THANKS

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