

Calculating drug needs and costs for treating visceral leishmaniasis using local patient anthropometric data from Brazil, East Africa and Indian subcontinent

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On behalf of the
VL anthropometric research
group
(still searching for a better name!)

Research group

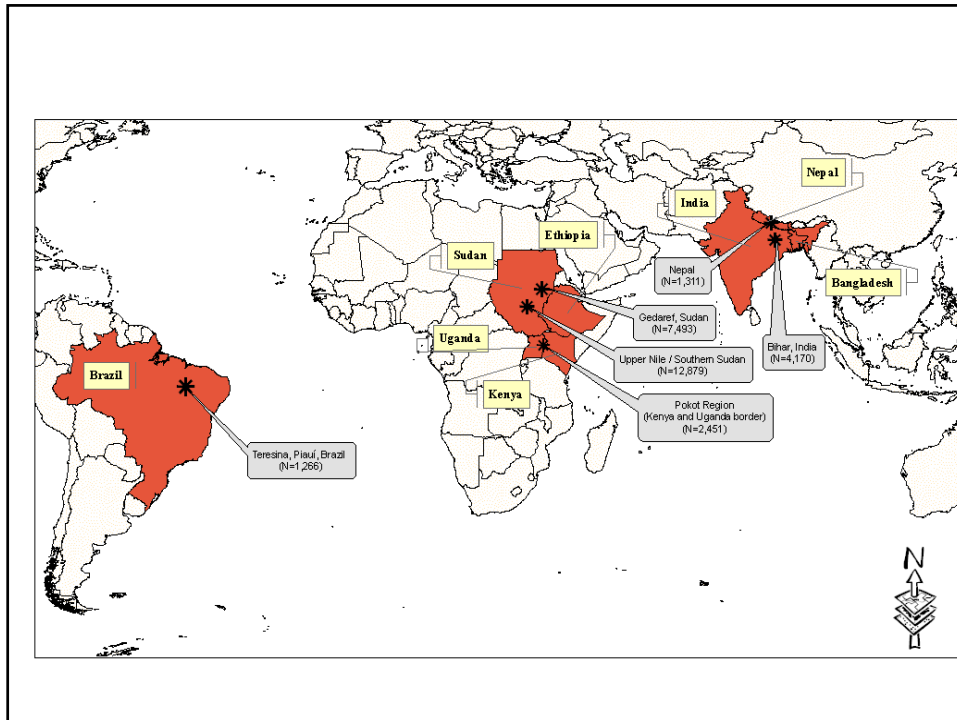
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Objectives

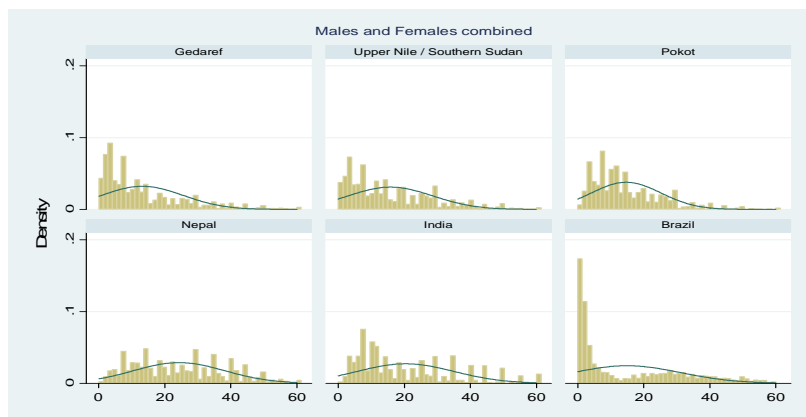
- Create a living anthropometric database (age, sex, weight, and height) with data from as many centers and clinics in VL endemic regions as possible.
- Identify population differences
 - Allow more precise and locally tailored drug procurement strategies and cost-effectiveness analysis.
 - Develop complementary interventions (e.g., nutritional)

Rationale

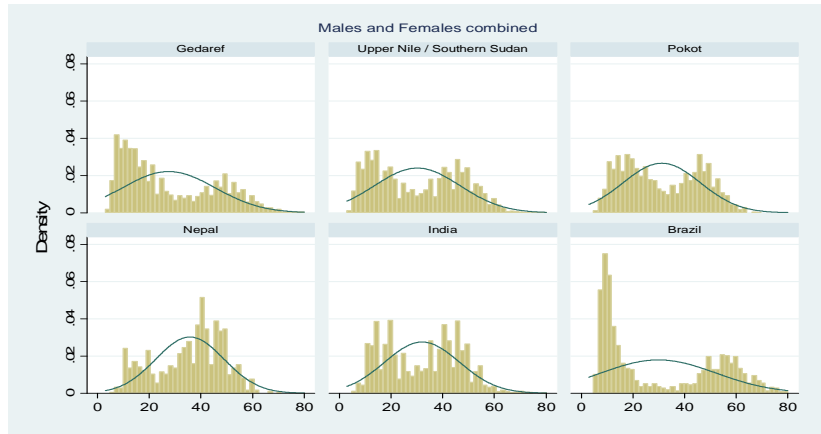
- Treatment armory has expanded:
 - Antimonials (1st line but India due to resistance) & Amphotericin B.
 - liposomal amphotericin B, miltefosine, and paromomycin
- Drugs dosed in mg/kg BW; miltefosine challenging in women of reproductive age (teratogenic)
- VL elimination campaign in the Indian subcontinent.
- Local anthropometric data needed to guide the forecasting of drug supplies and costs.



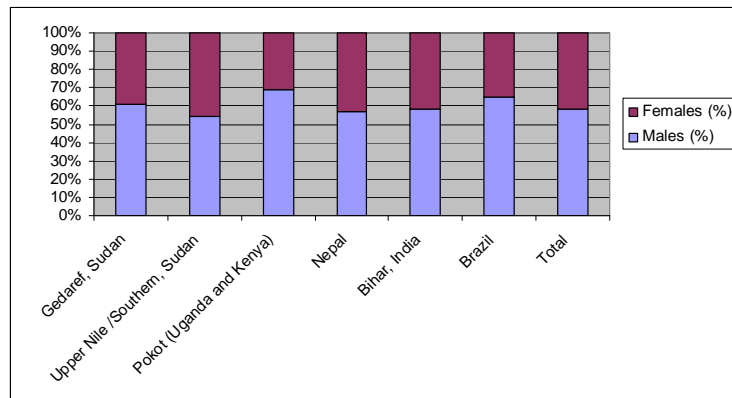
Age



Weight



Sex



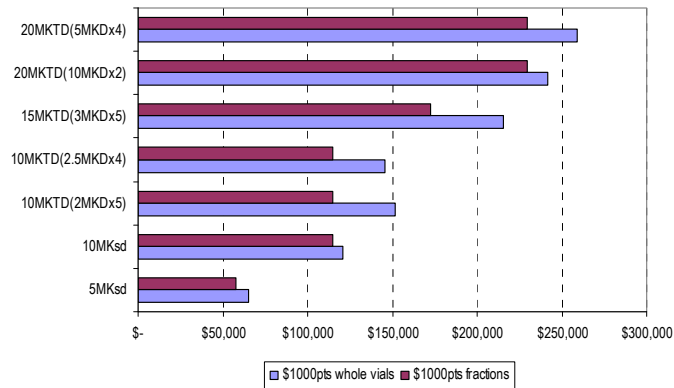
Nutritional status (<5yrs)

Indicator	Population / Location	N	<3 SD (%)
Weight-for-age	Brazil	603	4
	Gedaref	2499	32.9
	Upper Nile / South Sudan	3259	29.6
	Nepal	70	44.3
	Bihar, India	416	45.7
Height-for-age	Brazil	528	7.6
	Gedaref	2464	26.5
	Upper Nile / South Sudan	2916	9.2
	Nepal	69	24.6
	Bihar, India	191	38.2
Weight-for-height	Brazil	525	4.6
	Gedaref	2450	19.5
	Upper Nile / South Sudan	2730	39.3
	Nepal	61	27.9
	Bihar, India	195	14.9

Drug forecasting for costs and volumes

- Using our anthropometric data we are creating “theoretical” populations of 1000 patients who would display the same anthropometric profile.
- Examples:
 - liposomal amphotericin B (AmBisome®), India
 - Miltefosine
 - Paromomycin
- The costs presented here are the drug costs (other direct and indirect cost not considered in this analysis)

Cost of drug for AmBisome(R) (18US\$/50mg vial) dosing regimens for VL in India (wide variation in cost to treat population based on choice of drug vial)



Prospective cost of treating 1000 patients with miltefosine at current market and preferential price; two dosing categories: <25 kg and ≥25 kg body weight

Country	Body Weight Category	% pts	Market price Drug cost		WHO purchase Drug cost (\$)		Large volumes Drug cost (\$)	
			(\$)/pt	Cost (\$)	Small volumes per patient	Cost (\$)	per patient	Cost (\$)
Gedaref, Sudan	≥25 kg	56	\$150	\$84,000	\$85	\$47,376	\$72	\$40,152
	<25 kg	44	\$75	\$33,000	\$62	\$27,060	\$54	\$23,672
Upper Nile / Southern Sudan	≥25 kg	44	\$150	\$66,000	\$85	\$37,224	\$72	\$31,548
	<25 kg	56	\$75	\$42,000	\$62	\$34,440	\$54	\$30,128
Pokot	≥25 kg	42	\$150	\$63,000	\$85	\$35,532	\$72	\$30,114
	<25 kg	58	\$75	\$43,500	\$62	\$35,670	\$54	\$31,204
Nepal	≥25 kg	18	\$150	\$27,000	\$85	\$15,228	\$72	\$12,906
	<25 kg	82	\$75	\$61,500	\$62	\$50,430	\$54	\$44,116
India	≥25 kg	36	\$150	\$54,000	\$85	\$30,456	\$72	\$25,812
	<25 kg	64	\$75	\$48,000	\$62	\$39,360	\$54	\$34,432
Brazil	≥25 kg	55	\$150	\$82,500	\$85	\$46,530	\$72	\$39,435
	<25 kg	45	\$75	\$33,750	\$62	\$27,675	\$54	\$24,210

Prospective cost of treating 1000 patients with paromomycin; two dosing categories: ≤ 14 years and >14 years of age

Country	Category	% pts	Drug cost (\$ per patient)	
			Cost (\$)	Cost (\$)
Gedaref, Sudan	≤ 14 years	64	\$5	\$3,200
	>14 years	36	\$10	\$3,600
Upper Nile / Southern Sudan	≤ 14 years	53	\$5	\$2,650
	>14 years	47	\$10	\$4,700
Pokot	≤ 14 years	56	\$5	\$2,800
	>14 years	44	\$10	\$4,400
Nepal	≤ 14 years	27	\$5	\$1,350
	>14 years	73	\$10	\$7,300
India	≤ 14 years	44	\$5	\$2,200
	>14 years	56	\$10	\$5,600
Brazil	≤ 14 years	59	\$5	\$2,950
	>14 years	41	\$10	\$4,100

Conclusions & prospects

- Significant variations between patient populations (anthropometric \rightarrow costs).
- Efficacy, costs and practicalities will lead to different control/elimination strategies.
- The analysis of these differences can promote cost-saving and effective use of available therapies.
- Drug combinations are being tested.

\rightarrow Additional collaborators to sustain and develop a living anthropometric database + acquisition of local associated costs

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