



Non-motorized Transport and Communications in Health Care

June 2008
Aimee Gauthier

The Institute for Transportation and Development Policy (ITDP) was established in 1985, to promote people-centered, sustainable and equitable transportation worldwide.

Mass
Transit



Cycling
Advocacy



Supporting
Local Bicycle
Dealers



Cycle Design & Modernization



Access Africa Program



*increasing access to education,
employment, and opportunity*

Health Care



Situational Analysis

➤ Poor roads

- In Ethiopia, on average in rural areas, it is a 2 ½ days walk to the nearest paved road
- In Tanzania, it took 4.5 hours to go 100 km (about 62 miles) in an SUV

➤ Villages are spread far apart

- Tanzania's population density is 39 people per km²

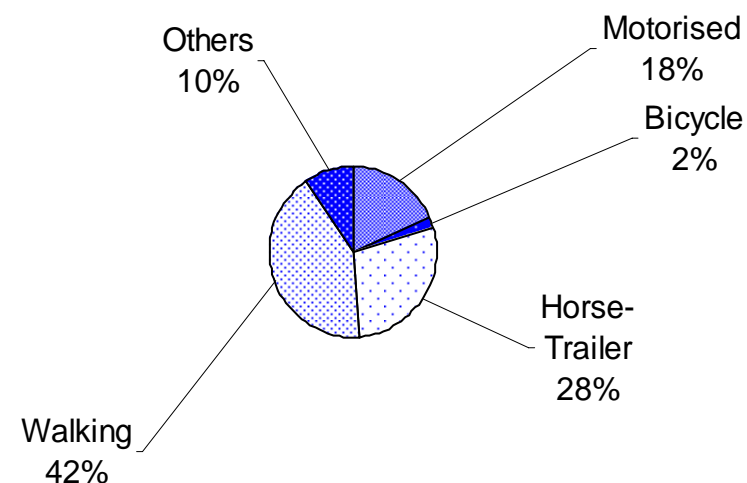
➤ Little money available for building new hospitals or clinics

- 70% of all Ghanaians live more than 5 miles from the nearest health care provider
- 77% of Namibians live 20 km or more from the nearest health facility

➤ Lack of access to vehicles and are expensive to rent if available

- In Senegal, most trips in rural areas are made by walking
- On average, it costs 40,000 tsh (about 36 USD) to rent a car for emergency transport in Tanzania

Modal Split for travel within the community
(in %; source: Enquete Senegalaise sur les indicateurs de Santé 2000)



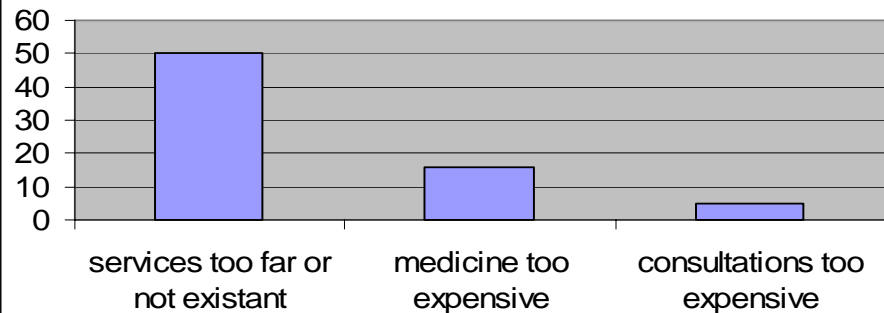
Problem Statement: Transport is *one* Bottleneck of Efficient Health Care

While there is wide agreement on that, there is not wide agreement about how to fix it.



Problems of access to health care in rural Senegal

(in % of household perception/ source: Enquete Senegalaise sur les indicateurs de Santé 2000)



In fact, transport is often treated as a peripheral issue

Accessibility constrained by: Geography – both distances and terrain

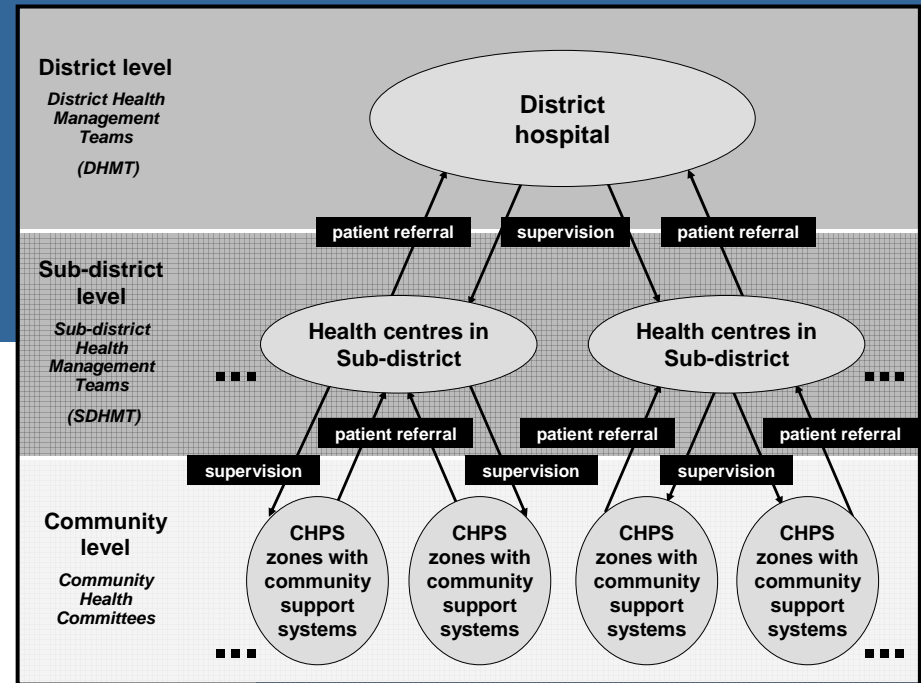
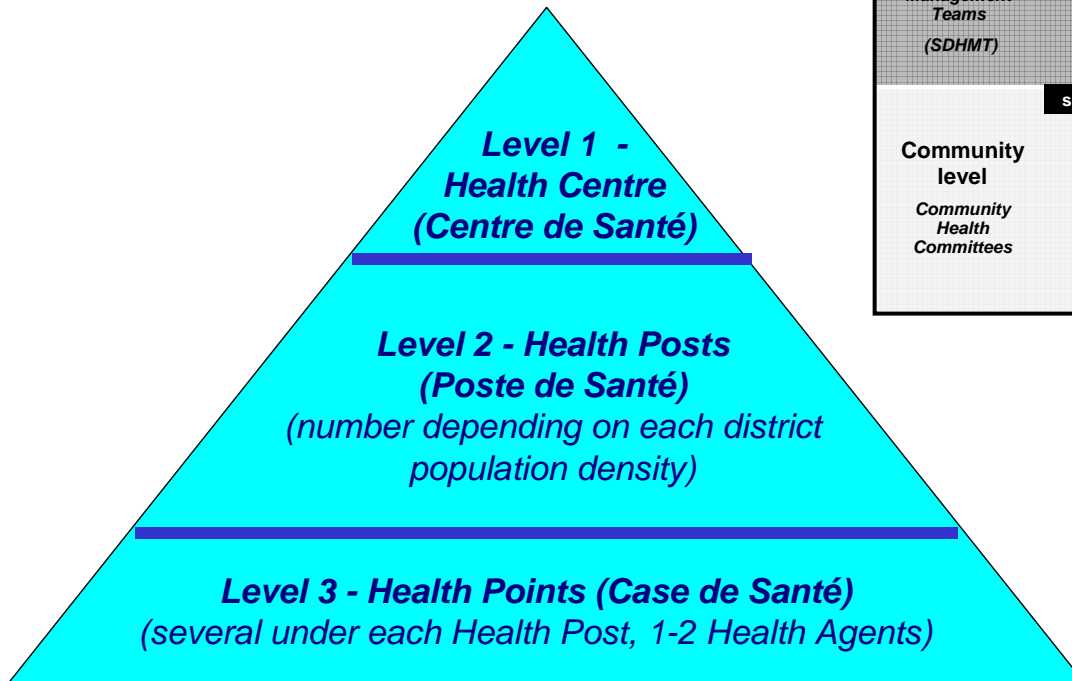


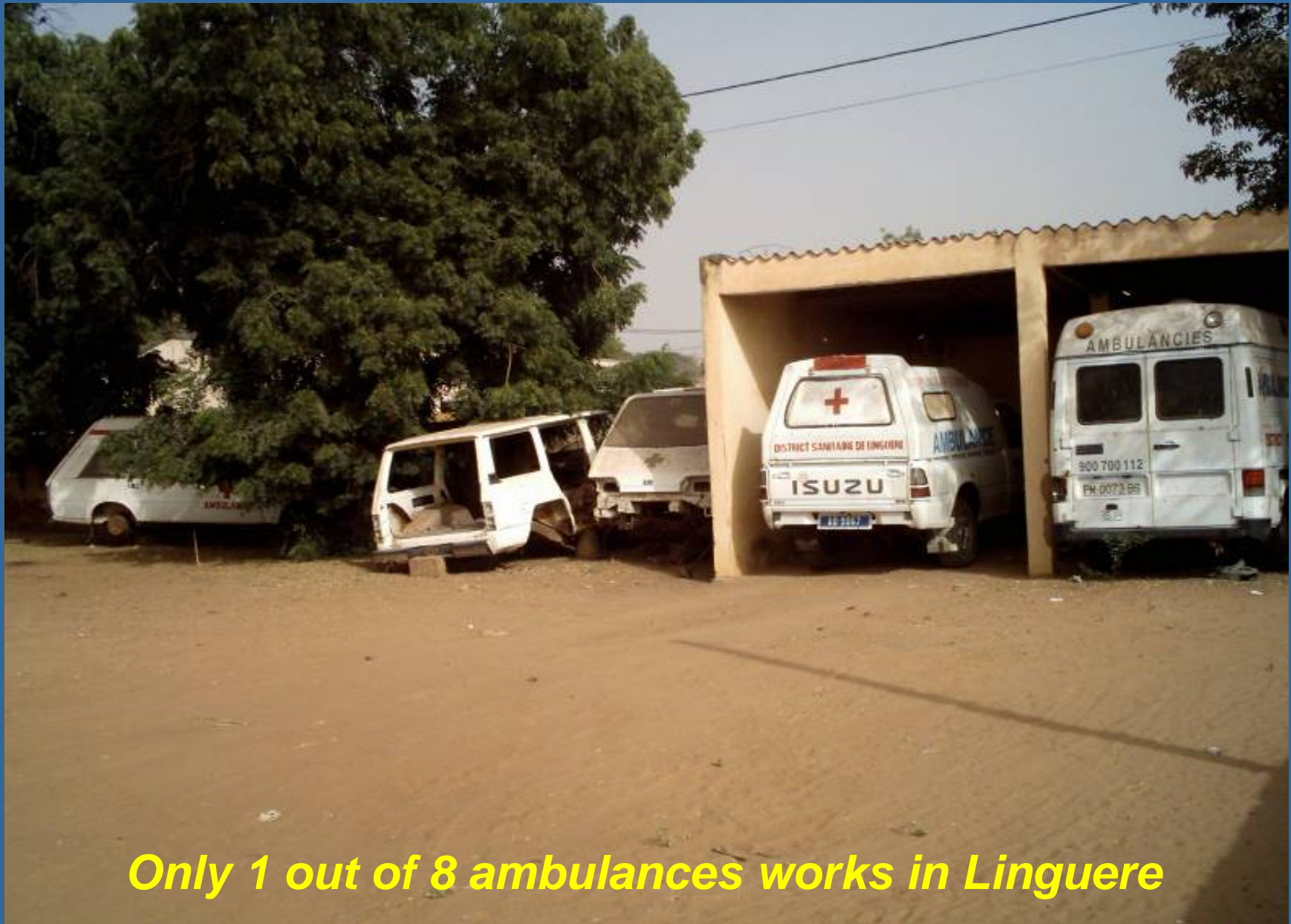
There are two main means of resolving those issues:

- 1) Transport equipment, and
- 2) Communication equipment

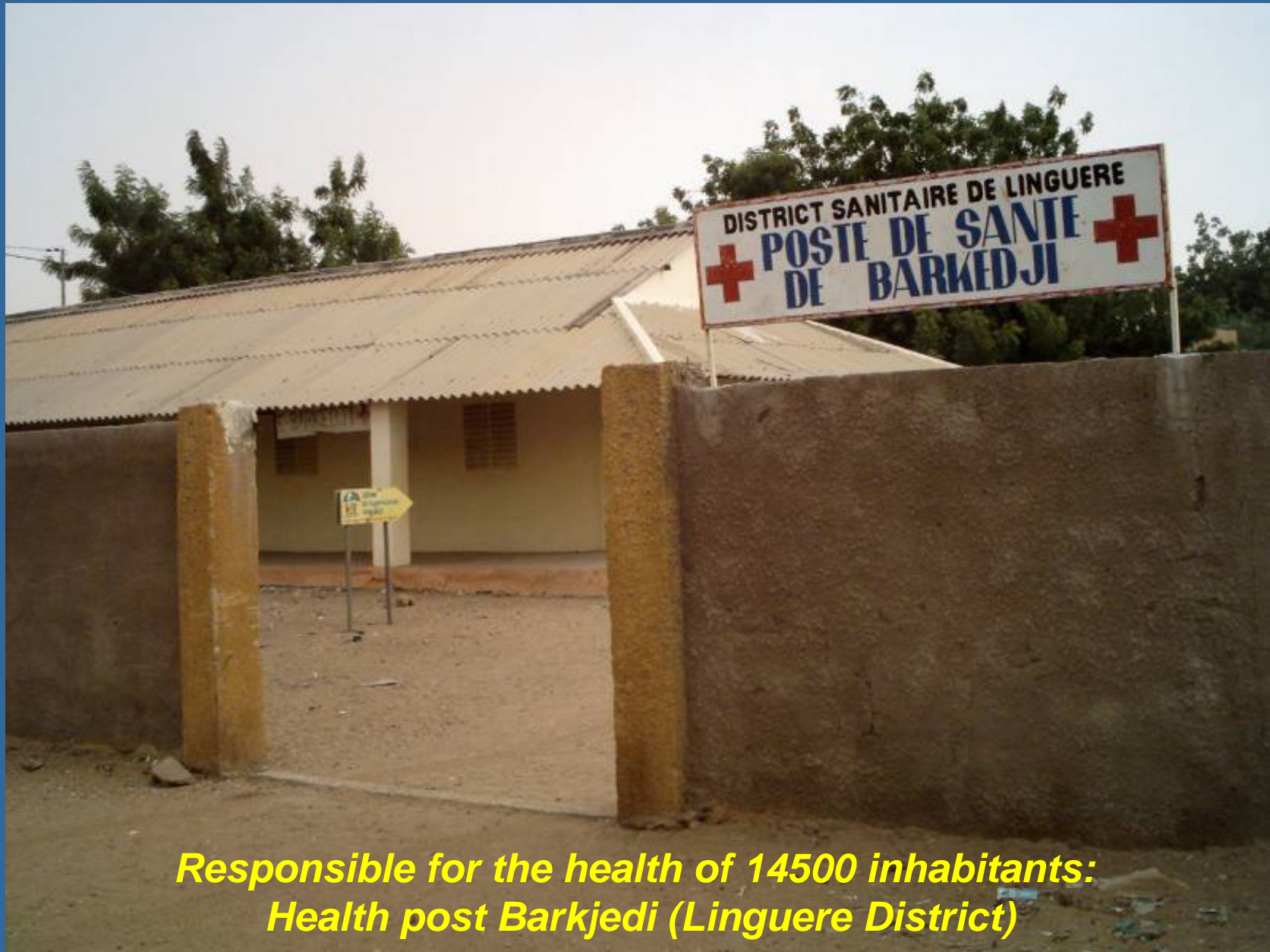
Health Care Structure:

We decided to focus on the sub-district level where the supply chain most evidently breaks down



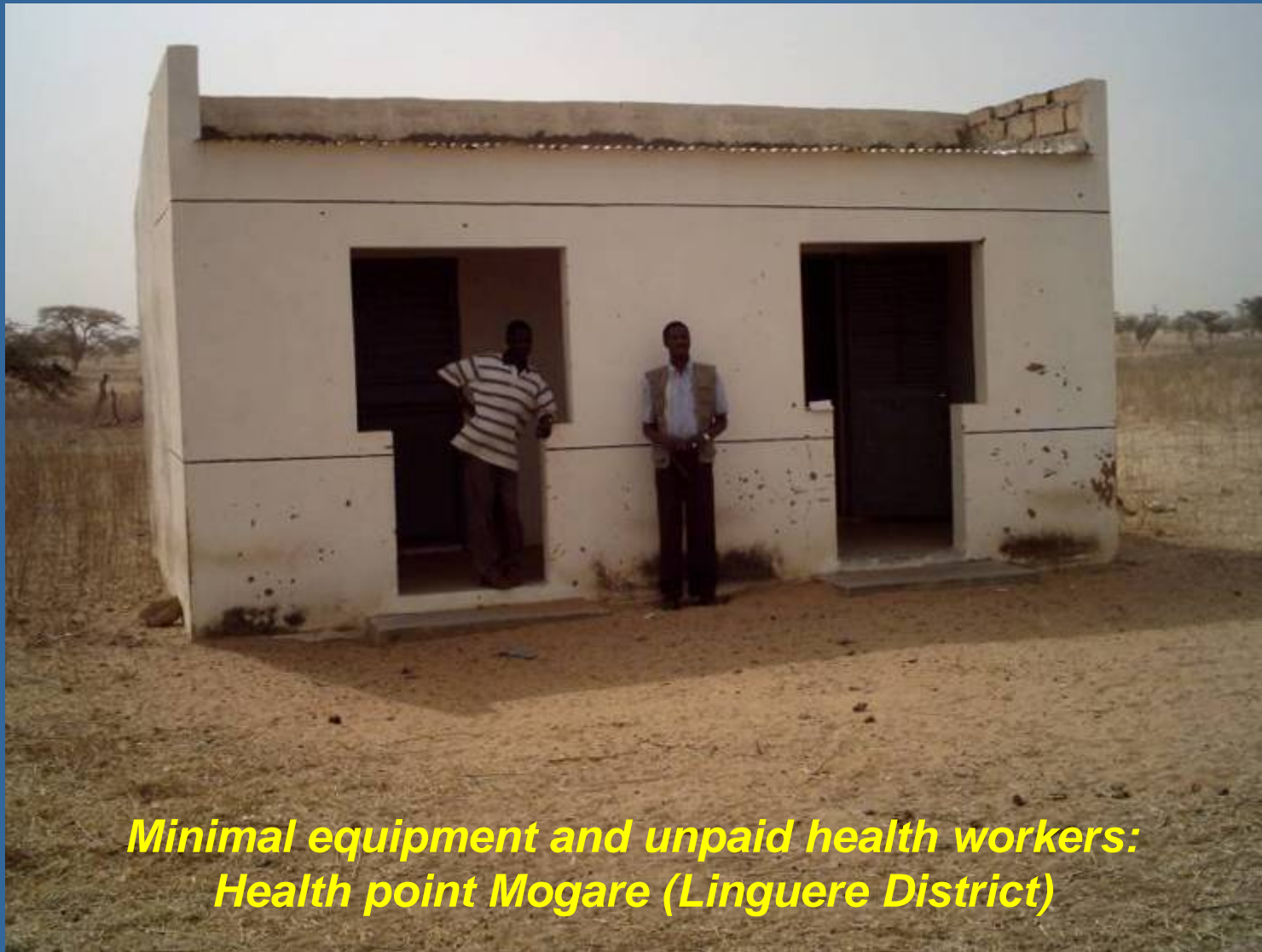


Only 1 out of 8 ambulances works in Linguere



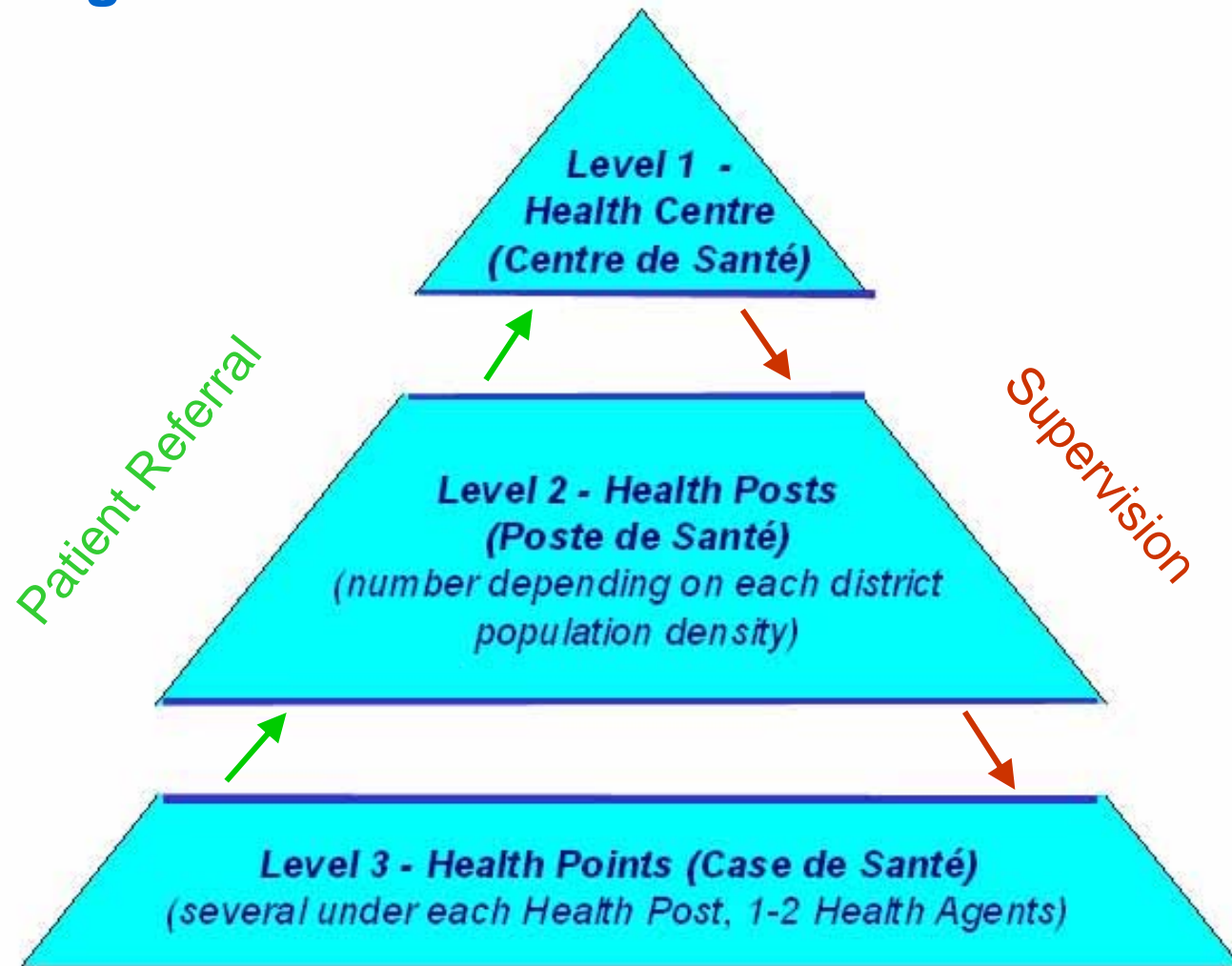
***Responsible for the health of 14500 inhabitants:
Health post Barkjedji (Linguere District)***

Point de Sante



*Minimal equipment and unpaid health workers:
Health point Mogare (Linguere District)*

Linkages between levels:



Bicycles

BICYCLES are an efficient and appropriate transport alternative in a spatial radius up to 20km, covering three times the distance and reaching 15 times more patients, cutting the transport cost in half

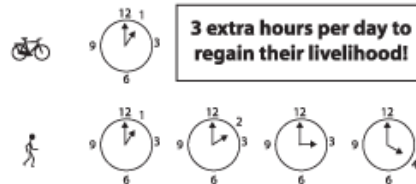


THE POWER OF BICYCLES

TIME

During a commuting day of 10 miles travelled, a bicycle saves 3 hours.

- walking - 2 1/2 miles per hour
- bicycling - 10 miles per hour



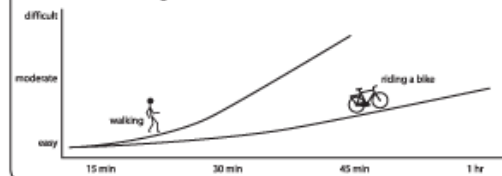
DISTANCE

Over equal units of time, one can ride a bicycle 4 times the distance as one walking.



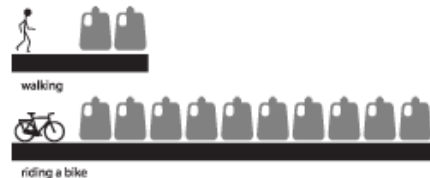
EFFORT

As time increases, effort to travel increases. Riding a bicycle requires less effort, allowing one to travel further in less time.



CAPACITY

Riding a bicycle increases one's capacity to carry by 5 times.



AREA

The average person can walk 2 1/2 miles in 1 hour - This equals access to an area of approximately 20 square miles. By bicycle that same area would be equivalent to 310 square miles.

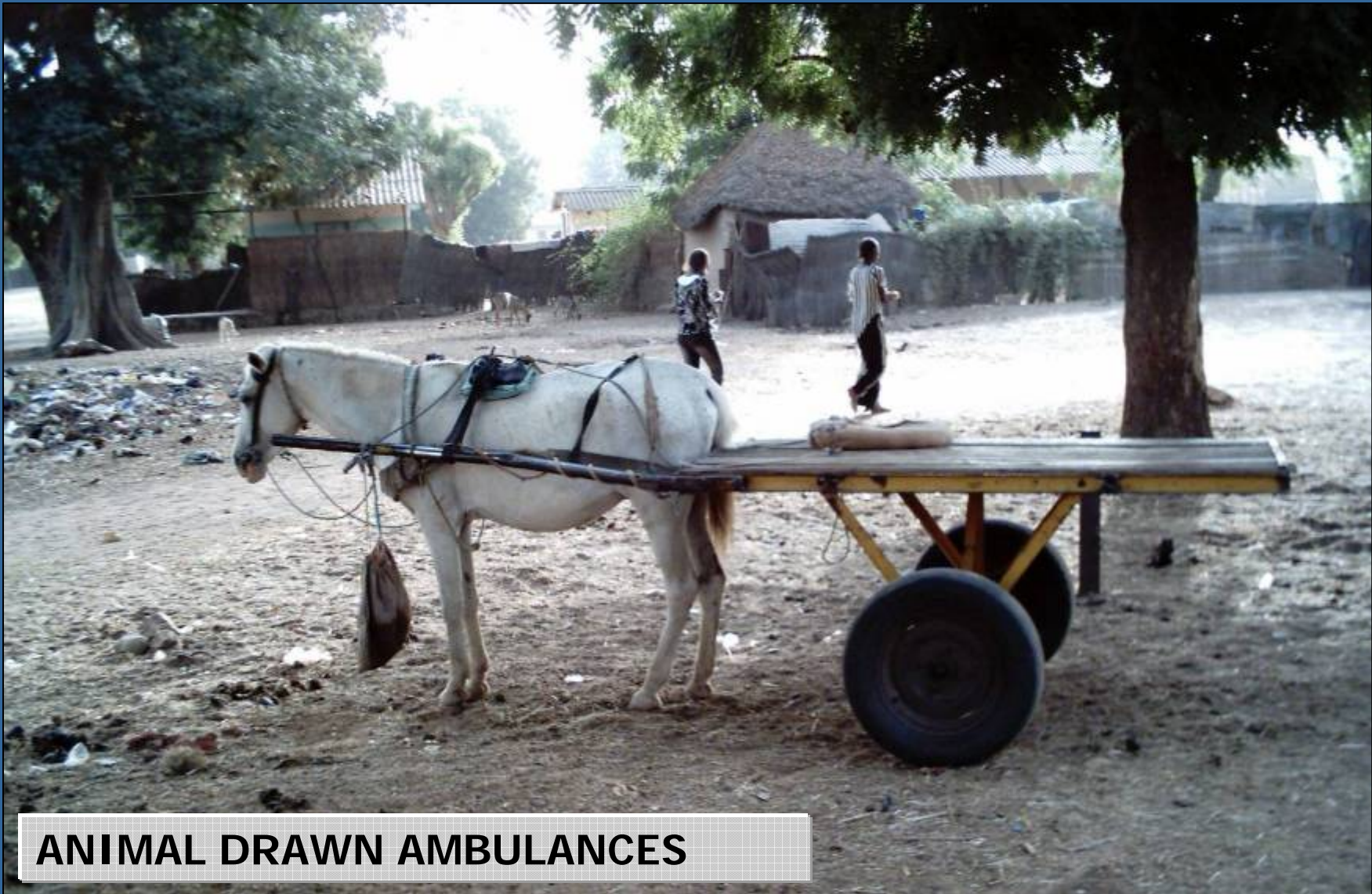


Nonmotorized Ambulances

BICYCLE AMBULANCES can carry immobile patients to health and emergency facilities. They can cover a radius of 10-20km.



Nonmotorized Ambulances



ANIMAL DRAWN AMBULANCES

Motorized 2- and 3- Wheelers

**MOTORCYCLES and
MOBILE CLINICS...**



...would be appropriate for health care activities with a radius greater than 20km – if skills, fuel, maintenance, and repair are given

Motorized 2- and 3- Wheelers



Communication Technology

COMMUNICATION TECHNOLOGY can be used for...

- ... asking for professional medical advice (phone based treatment)
- ... organising emergency transport and
- ... organising referral of non-emergency cases



**For 1 Truck, you could purchase
176 bicycles or 10 motorcycles**

	Purchase Costs	Running Costs	Lifecycle	Total Costs
	<i>USD</i>	<i>USD per year</i>	<i>Years</i>	<i>USD</i>
All-terrain Truck	\$ 20,909.09	\$ 4,848.48	7	\$ 54,848.48
Motorcycle	\$ 3,181.82	\$ 454.55	5	\$ 5,454.55
Bicycle	\$ 177.57	\$ 26.64	5	\$ 310.75

**For 1 Ambulance Car, you could purchase
4 motorcycle ambulances or
27 nonmotorized ambulances**

ITDP Pilot Projects in Senegal and Ghana: Strengthening the linkages at the Case de Sante

Senegal	
<i>Kaffrine District</i>	<i>Linguerre District</i>
<ul style="list-style-type: none"> • 7 bicycles • 3 communications systems • 5 horse/donkey ambulances 	<ul style="list-style-type: none"> • 9 bicycles
Ghana	
<i>Saboba District</i>	<i>Savelugu District</i>
<ul style="list-style-type: none"> • 10 bicycles • 2-4 communications systems 	<ul style="list-style-type: none"> • 7 bicycles • 2-3 communication systems • 1 bicycle ambulance • 1 donkey ambulance



In Addition to our pilot projects:

- BEN Namibia has donated 320 bikes to HIV/AIDS outreach workers
- Biketown has donated 300 bikes to health care workers in Botswana
- FABIO has distributed over 400 bike ambulance in Uganda
- ITDP has donated 300 bicycles to health care workers in South Africa, Zambia, Malawi, Uganda, Tanzania



What did we find?



Communications Component Key

- More efficient use of scarce transport resources (call before going to pick up supplies)
- More efficient use of scarce personnel (can send patient knowing nurse is there waiting)
- Strengthens referral system
- Did not get used as much anticipated for over the phone diagnosis
- Power an issue for cell phones and radios
- Radios more expensive capital outlay, less expensive running costs
- Cell phones more flexible but network unstable, operating costs can be high



Nonmotorized Transport Key

- Bikes helped mobilize people and improve information flow to communities
- Became easier to organize immunization campaigns, and others
- Health issue awareness was raised as CHVs were seen more often in the villages
- New bike improved image of CHV
- Helped with emergency cases – in getting to health point to make a call for emergency transport or in being paired with NMT ambulances in an effort to coordinate treatment (i.e. for pregnant women_
- The animal and carts in Senegal were much more successful because they are already used a lot there. The most successful application was transporting outreach teams.

On average, bicycles were used 2-6 times per week for trips between 1km (within the community), 3-6km (for trips to remote communities) and 20km (to the next health centre or CHPS). Therefore, a bicycle has an average total travel of 20 - 30km per week with an optimum spatial radius of 9km.



Donations are Bad

- lack of control over the supply chain and at whim of donor
- Lack of ownership from community
- No one ever looks a gift horse in the mouth



Ownership is a big Issue



- The ultimate in decentralization
- Who owns and controls the assets? Health care providers, both administrators and users not sure what to do with the bikes
- Many organizations will tightly control the bicycles to the point of making them more of a burden than a blessing, ex: Biketown
- Political power structures might require that a bike go to the chief, but no one wants to say that to a donor afraid that they will take their donation away. But in the end the bike goes to the chief.
- Project ownership – who initiated, does it feel imposed (GH: district office was engaged but it took the national offices over 4 months to organize the transportation of the equipment to the region)

Change takes time

- Even low-technology is still a new technology and takes awhile for adaptation to occur
- Change cannot be achieved by the giving of the vehicles alone
- Cannot even be achieved by doing some maintenance systems and usage seminars
- Have to overcome some cultural biases and reservations
- Example, motorcycles in Ghana and bike ambulances



Need Strong Private Sector Partners

- For all vehicles, spares are ultimately going to make or break the project. For motorized, fuel is an additional issue
- In the very rural areas, even tubes can be hard to find
- Is it better to have a lesser quality vehicle that needs more maintenance but the spares are readily available or a higher quality vehicle which will not need as much maintenance but when it does the spares are not available?
- Be careful of monopoly suppliers
- Ghana: Motorola



Scale of Project

- Many NMT and animal traction projects have been tested, but on a scale so small that they were doomed to failure
- Not commercially viable
- Little to no manufacturing base in Africa, even of hand carts and animal carts, to support these projects – makes supplies more expensive
- Not enough made to effectively test – or there is a disconnect between the engineering and technical aspects and the use and implementation – that leap never gets made
- Many more have been implemented and the carcasses of these experiments litter the country-sides of many African countries
- Example: Donkey Welfare of Namibia
- One exception: Fabio's project of bicycle ambulances in Uganda



Monitoring and Evaluation of NMT projects

- Distance is a barrier for supervision - Most of these participants live far from each other and from district health center
- Log books too delicate to take out in field
- Paperwork and recording generally a problem at the local level
- Need to incorporate it into existing paper work systems
- Participants already feel overworked without adding an additional burden
- Even tried odometers



Next Steps / Solutions?

- Scale: need to work on an entire district at all three levels with all affected This means the cars, trucks, motorcycles, and NMT people need to work with the health ministries, NGOs, communities, as well as the Roads and Transport ministries
- It needs to build on the existing health system to support it and not seek to impose additional unreasonable requests to their already over committed and under resourced environment – it needs to strengthen the system
- Ideally this also means that the national government intervenes to support investment from the private sector that will support these interventions
- It should be a focusing of resources at a scale that will make it (potentially) commercially viable.
- It should not be the poorest of the poor, the worst off, or the one with the biggest problems