NIPH

Kamuzu Central Hospital

Oslo University Hospital

A collaboration between Kamuzu Central Hospital, Norwegian Institute of Public Health and Oslo University Hospital, Norway

Road Traffic Injuries in Malawi

With special focus on the role of alcohol

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Road traffic crashes – globally

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- WHO: About 1.3 mill people die on the roads every year – most in Low- and Middle-Income Countries (LMIC) representing about 90% of the registered crashes and about 60 % of the motor vehicles
- Fatal road traffic crashes are the **leading cause of death for the age group 15-29 years**
- Unknown number of injured in road traffic crashes: 30 – 50 mill /year ?
- Significant decline in fatal crashes in High Income Countries during the last few years – while increase in LMIC – consequently, the number of deaths on the roads is stable
- **Malawi is among the countries with the most road traffic fatalities in the world – data varies from 20 to 35 per 100,000 population per year depending on the sources (Norway last five years: About 2 per 100,000)**
- The legal blood alcohol limit for driving a motor vehicle in Malawi is 0.08 %

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Road traffic crashes
World Bank support

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- United Nations (UN) declared in 2010: *The Decade of Action for Road Safety 2011–2020* against road traffic crashes: The goal was to halve the number of deaths on the roads within the end of 2020 (Sustainable Development Goal: 3, target 3.6)
- The WB's "Global Road Safety Facility" established earmarked funds for projects connected to road safety in LMIC
- The WB has been the main sponsor of this project
- The International Council on Alcohol, Drugs and Traffic Safety (ICADTS) has given important advice and financial support

Project Partnerships

- Malawi and the Norwegian Institute of Public Health previous history of trusted project partnerships. With thanks to contacts established with Dr. Sven Young, orthopedic surgeon from Norway working at KCH for many years and connected to Haukeland University Hospital, Norway and the leadership of Director Dr. Jonathan Ngoma, KCH Director and, Dr. Carlos Varela Head of the Emergency Dept, and other interested staff members

Norway

- **Norwegian Institute of Public Health**
- Dr. Asbjørg S. Christophersen, Project Leader, Dept. of Global Health
- Elin H. Wyller, Project Coordinator, Dept. of Global Health
- Dr. Bjørn G. Iversen, Senior Medical Officer, Dept. of Global Health
- Karine Nordstrand, Director, Dept. of Global Health
- **Oslo University Hospital**
- Dr. Hallvard Gjerde, Senior Researcher, Section of Drug Abuse Research
- Dr. Stig Tore Bogstrand, Head of Research, Section of Drug Abuse Research

Malawi

- **Kamuzu Central Hospital**
- Dr. Jonathan Ngoma, Director
- Dr. Carlos Varela, leader, Head of the Emergency Dept., MD
- Gift Mulima, MD, Project coordinator
- Chifundo Kajombo, MD, Project coordinator
- Lovemore Kamange, MD, Patient recruitment
- Noel Yotamu, MD, Patient recruitment
- Dr. Sven Young, MD
- Dr. Leonard Banza, MD

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Aims

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- To generate new knowledge about injurious traffic accidents in Malawi and the extent of road traffic crashes (RTC) related to alcohol, and develop a database for the findings
- To develop a questionnaire in collaboration with KCH staff to collect important data for the hospital and authorities related to risk factors and possible improvements
- To train local employees at the hospital to perform alcohol testing on patients using different types of equipment and to record data about the patients in the database
- To record information about the patients' alcohol use before the injury, accident circumstances, type of vehicles involved, transport time to KCH, and availability of medical treatment
- Two project coordinators hired for implementation of the project – trained by the Norwegian group

Preparations
Agreements
Contracts

- Questionnaire was developed and transferred to electronic tablets
- Project information documents prepared for the patients (English + Chichewa)

Ethical approvals:

- National Health Sciences Research Committee (NHSRC) – Ministry of Health Malawi
- Data Protection Impact Assessment was performed in accordance with European law
- The Norwegian Regional Committee for Health Research Ethics was consulted
- Data protection Officer at NIPH approved data transfer to Norway

Contracts:

- Norwegian Church Aid office in Lilongwe (payment of local project expenses and fees)
- KCH, working instructions, confidentiality statements

Methods

- Patients injured in Road Traffic Crashes (RTC) who arrived at Emergency Department KCH were asked to participate
- Written and oral information was given by recruiting doctor
- All type of road users of 18 years of age and older:
  - Drivers of cars, motorcycles, mopeds, buses, trucks, ox carts, etc.
  - Cyclists
  - Passengers
  - Pedestrians
- Voluntary participation – signed accepted forms. No name or birth data recorded – only anonymous data
- All working days and weekend days were covered, day and night
- Breath testing for alcohol, or saliva testing for patients not able to blow
- If alcohol was tested in saliva from unconscious patients, the result was not used before the patient was conscious and informed about the project - the results were deleted if the patient denied participation

Alcohol breathalyzer and saliva tests

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Dräger Breathalyzer

QED© Saliva Alcohol Test
Results within 2-3 min

Results

Dr. Gift Mulima – Dr. Chifundo Kajombo

Kamuzu Central Hospital, Lilongwe Malawi

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Results

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- Recruitment started in May 2019 – continued for about 3 months
- Two young doctors did most of the recruitment job – trained and assisted by the two project coordinators
- Regular phone contact with project group in Norway during the whole period
- 1347 patients at least 18 years of age were asked to participate, 1259 gave informed consent, 8 patients were not tested for alcohol or asked for alcohol use before the crash
- **1251** patients were then included in the study – i.e. 95% participation; very good for such a type of study!
- About 40% of the patients arrived KCH at least 3 hours after the crashes – about 15% more than 6 hours later (See table)
- To obtain complete data on alcohol use, self-reported data was combined with test results from patients with a negative alcohol test – presented in the figures

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Positive alcohol test and self reported alcohol use in relation to time between crash and examination

	Time between crash and alcohol test (hours)						
	<2:00	2-2:59	3-5:59	6-11:59	12-23:59	24+	Unkn.
No. of patients	632	190	240	53	61	49	26
Positive alcohol test (%)	19.1	22.6	30.8	13.2	3.3	4.1	11.5
Self-reported use (%)	15.7	18.9	22.1	7.5	23.0	20.4	19.2
Either positive alcohol test or self-reported use (%)	21.7	26.8	35.0	13.2	23.0	20.4	30.8

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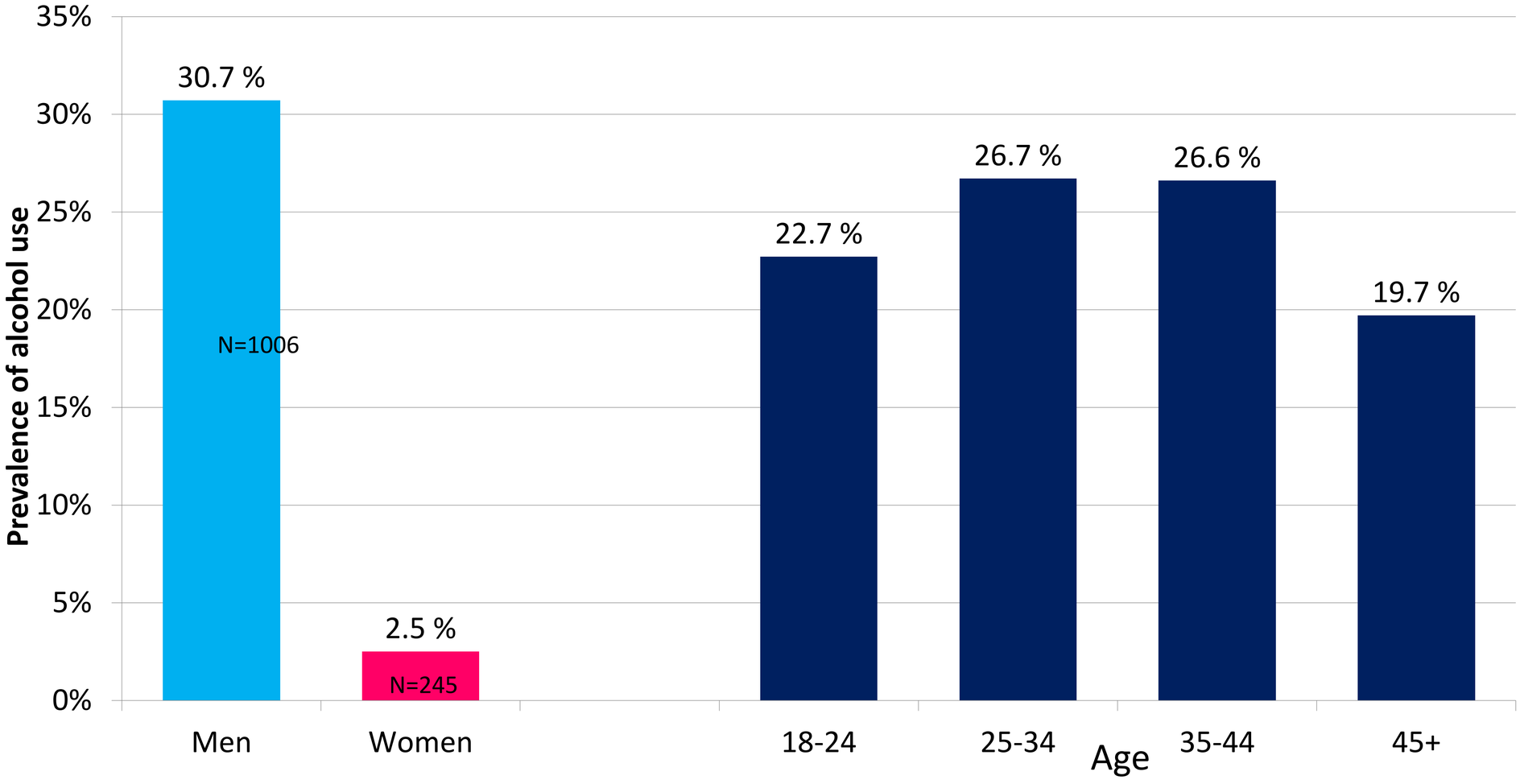
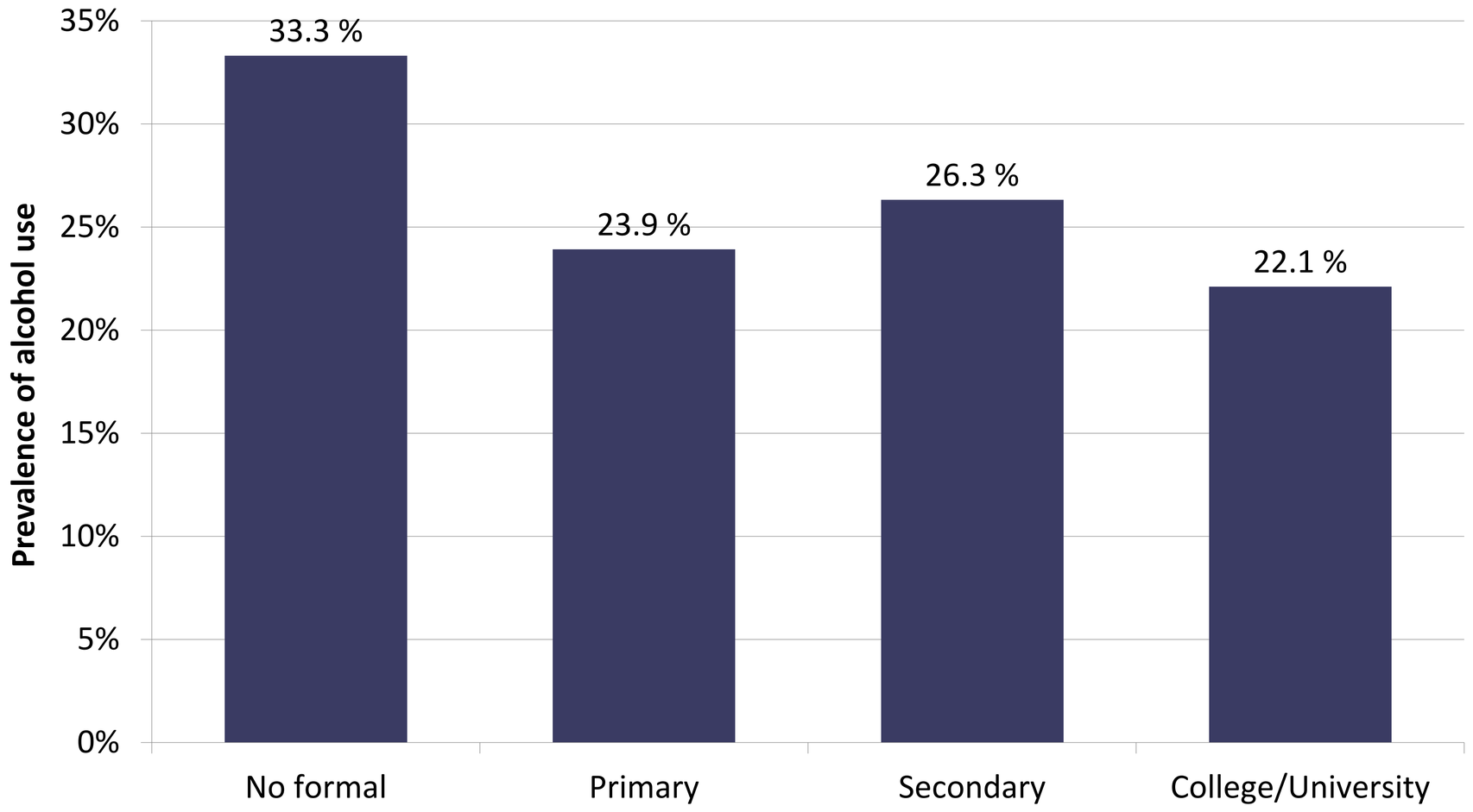
Prevalence (%) of alcohol use across gender and age



Prevalence (%) of alcohol use by level of education



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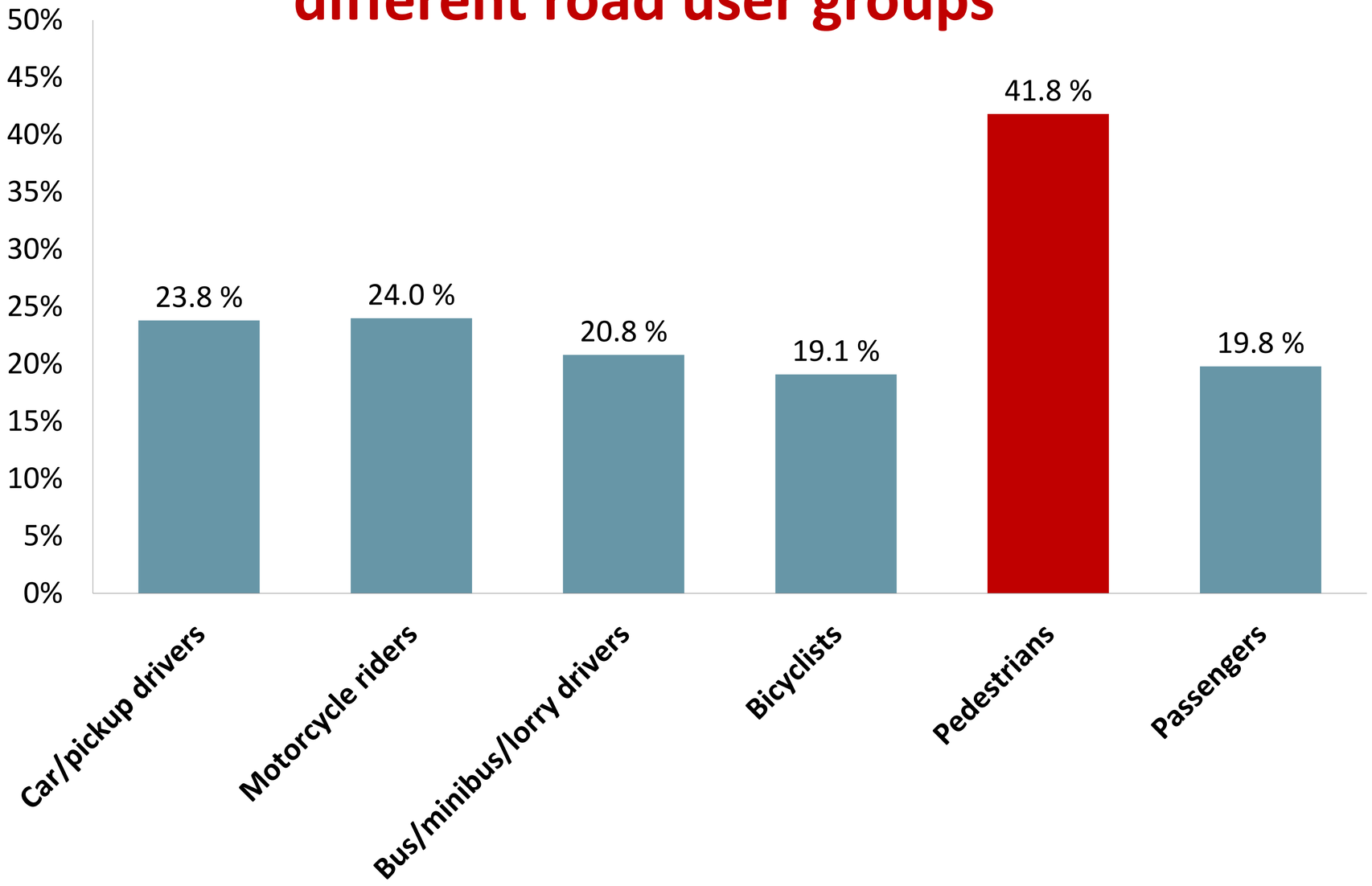
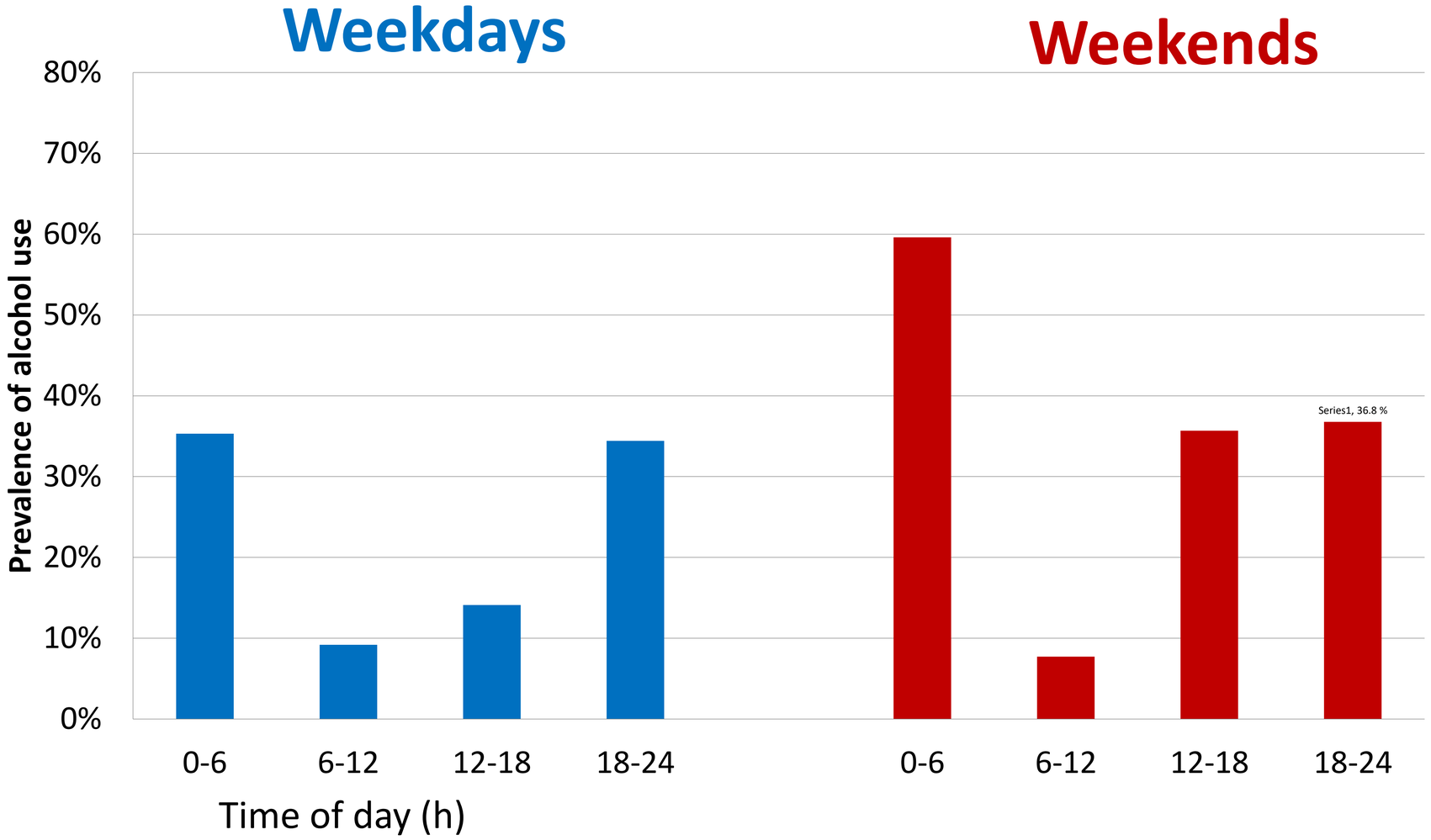
Alcohol use before injury among different road user groups



Alcohol use in relation to time of road traffic injury

(Weekend was defined as starting Friday 18:00 and ending Monday 06:59)



Estimation of alcohol at time of crash

- Blood alcohol level at the crash time was calculated among drivers arriving at KCH within five hours after the crash
- The mean alcohol elimination rate of 0.015 % per hour was used for calculations
- 15.2 % of the injured motor vehicle drivers had an estimated alcohol concentration at the legal limit of 0.08% or above at the time of crash (provided that no alcohol was consumed after the crash)

Estimated alcohol level ≥0.08% for the different motor vehicle drivers/riders

- Car/pick-up drivers: 15.8 %
- Bus/minibus/lorry drivers: 16.3 %
- Motorcycle riders: 13.9 %

Comments to alcohol results

- As far as we know, this is the first systematic study of alcohol use among injured road users in Malawi
- The total prevalence of alcohol among injured road users was about 21%, similar to studies in many other countries
- About 14-16 % of the drivers/riders had an estimated alcohol level at/above the legal limit at the time of the crash
- Male patients represented the majority of the injured patients. Only one out of five was female, only 2.5% of those had used alcohol before the crash
- Minor differences across age groups – highest proportion of alcohol among those aged 25 – 44 years
- Alcohol was found among one out of five professional drivers – many countries have lower legal alcohol limits for this group of drivers

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Comments to alcohol results (cont.)

- High prevalence of alcohol among injured pedestrians. This is a vulnerable group – often walking in the dark without any road lighting, lacking pavements, walkways or marked zebra crossings, and mostly without any reflective gear
- Large differences were found across times of the day and week
- Highest prevalence of alcohol was found during weekend nights from midnight to 6 am (59.6%)
- High alcohol prevalence was also found at other time periods during the week: weekday nights and all days from 6 pm to midnight
- These results should be taken into account by the police when planning road traffic controls

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Google map registration

- The map registrations of crashes show areas with high incidence of accidents and possible risk areas
- The maps illustrate crashes at cluster areas – some difference between injured road user groups
- The results may be valuable when planning preventive actions
- Some examples are presented

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Google map registration - all crashes

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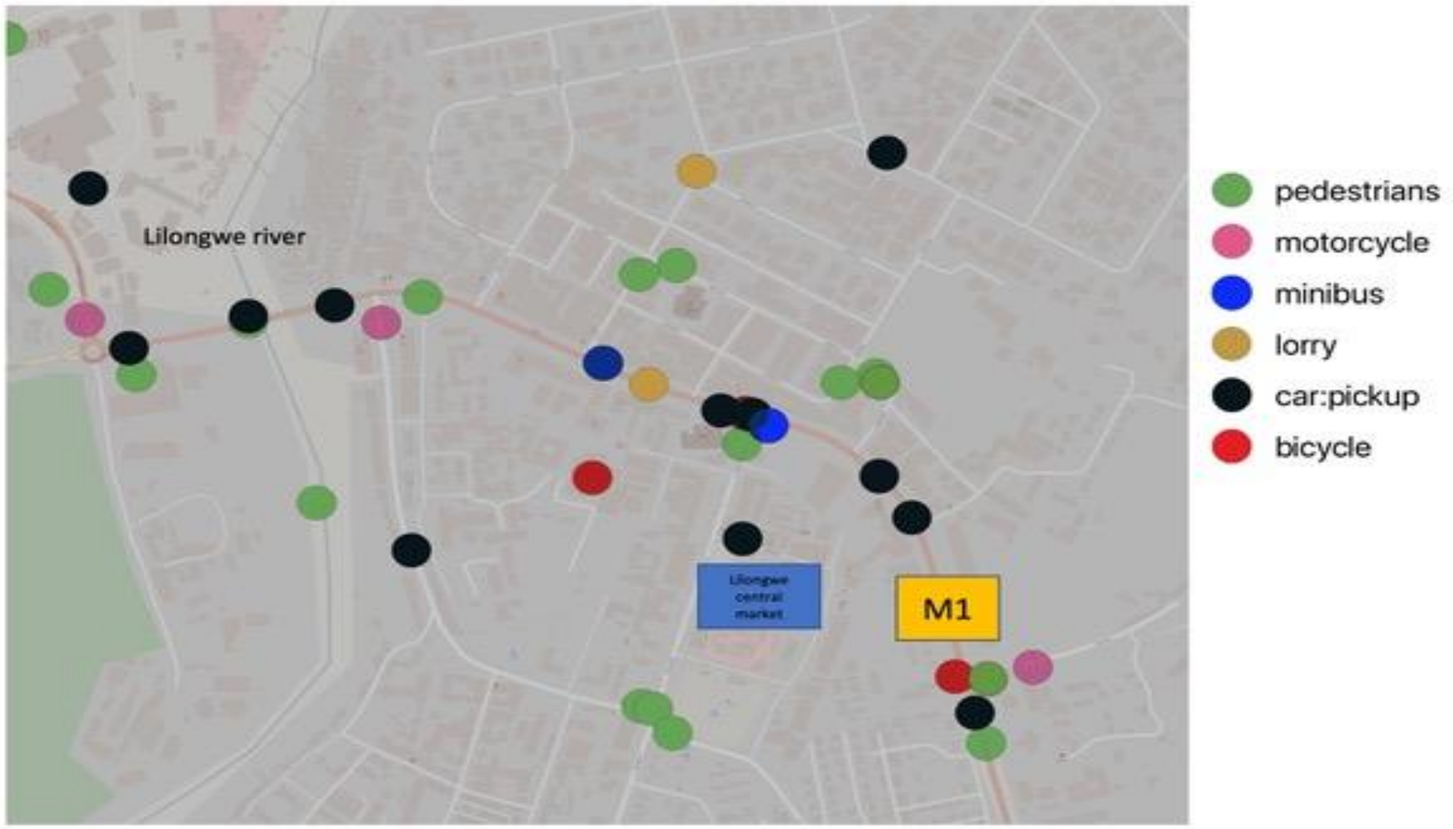
Google map registrations:

place of crashes for different road user groups



Publications - international journals

Three articles from the project have been sent to international journals. One published – another accepted for publication – the third one under review:

- Mads Sundet, Chifundo Kajombo, Gift Mulima, Stig Tore Bogstrand, Carlos Varela, Sven Young, Asbjørg S. Christophersen, and Hallvard Gjerde: ***Prevalence of alcohol use among road traffic crash victims presented to a Malawian Central Hospital: a cross-sectional study.*** Traffic Injury Prevention, 2020. https://doi.org/10.1080/15389588.2020.1819990
- Mads Sundet, Gift Mulima, Chifundo Kajombo, Hallvard Gjerde, Asbjørg S. Christophersen, and Sven Young: ***Adult pedestrian and cyclist injuries in Lilongwe, Malawi: a cross sectional study.*** Malawi Medical Journal, 2020 (Accepted for publication).
- Mads Sundet, Gift Mulima, Chifundo Kajombo, Hallvard Gjerde, Asbjørg S. Christophersen, **Jan Erik Madsen, Sven Young:** ***Geographical mapping of road traffic injuries in Lilongwe, Malawi.*** Injury 2020 (under review)

Recommendations – Conclusion

Asbjørg S. Christophersen

Norwegian Institute of Public Health

Recommendations

Our results showed high occurrence of alcohol-related RTCs. We recommend the following mitigations to reduce the number of alcohol-related RTCs and their economic burden for many families. SDG 3.6 can be achieved if the following recommendations are followed:

1. Malawi has a high BAC legal limit (0.08%). The authorities should **consider lowering the BAC legal limit to 0.05% in accordance with recommendations from WHO**, like most European countries, some US states, Canada and others. Changes must be *followed by sustained and widely disseminated information and educational campaigns*.
2. Our findings showed **approximately one out of five professional drivers, particularly drivers carrying passengers, were involved in alcohol related crashes**. For this group, a lower legal BAC limit should be considered. *A lower BAC limit for professional drivers (down to 0.02 %) has been implemented in many countries.*
3. The Malawi Road Traffic Offences and Penalties for driving a vehicle while under the influence of intoxicating liquor or drugs, as regulated in **section 139 of the Road Traffic Act, needs to be enforced**. To ensure such enforcement, *adequate resources need to be allocated to traffic police*

Recommendations (cont.)

4. Findings from map registrations showed that many **RTCs were recorded in clusters**, which varied for the different road user groups. Safety improvement of those areas should therefore be prioritized
5. The police should focus their controls on **time periods with high frequency of alcohol related crashes**, primarily weekend nights but also weekday nights. In order to do so, the police must be provided with the necessary testing equipment
6. **Reflective gear for pedestrians** should be recommended and provided, as well as **installment of road lighting at pedestrian crossings and painted zebra crossings**

Recommendations (cont.)

7. The data from this study should be disseminated, shared and discussed by stakeholders in Malawi from the different sectors: **health, transport, police and education**
8. It is important that the authorities representing health, transport, police and education develop plans for a **comprehensive information and educational campaign on alcohol use as an important risk factor for road traffic safety.** Newspapers, TV- programs and other type of information media need to be engaged in such campaigns
9. In addition, corruption must be avoided and replaced with a **Culture of Road Safety to join forces across sectors to combat drunk driving and injurious and fatal RTCs**

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Conclusion

Our results will hopefully be of use to the health, transport and justice authorities, in addition to the police to develop evidence-based and informed policies for information and education campaigns in addition to interventions for road traffic safety.

Thank you for your attention!

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