

Entertainment Preference Priorities of Drivers in the Driving Cabin



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Abstract

This research paper investigates cabin interior music preferences from the drivers' point of view. The results of an in-depth audit were used to understand how music preference in vehicle cabins an impact on comfort preference based on survey answers. Furthermore, the finding labels the occupants' music preference specification in the cabin. The sample involved 373 drivers (33% female, 67% male). The age distribution was: 18 to 30 years (n=217), 31 to 50 years (n=48), 51 to 70 years (n=59), and 71 years and above (n=49), of drivers of fourteen different nationalities. From all the questionnaires distributed around 0.03% (11) of respondents did not react. The inquiry served as a tool to capture driver's desires in the vehicle interior cabin, specifically the entertainment preference and comfort. The results clearly show that different age categories and gender variations have different entertainment preferences while driving.

Keywords: Driver Music Preference; Driver Noise Level Preference; Hearing Trouble; Safety Drive; Driving cabin

Introduction

Music and its noise level have a great deal of influence on driver performance. Drivers prefer different types of music and volume level based on age and gender. Even if music has a significant impact on driver behaviours its preference and noise level also play a significant role in driver performance. Researchers agree that music preference and level of volume not only motivates the driver it also affects his/her health. Music noise affects people's health by increasing general stress levels and aggravating stress-related conditions [1-3]. Drivers will be exposed to a continual layer of ambient noise from the vehicle while driving and this could have an effect on blood pressure, digestion, and more [4-6]. Much of in-vehicle noise is random white noise and several studies have indicated that stress resulting from this can induce the release of cortisol [7-9].

Noise can make drivers angry and cause ear pain during vehicle operation [10-12]. The prefrontal cortex possibly also stores short-term memories, therefore continued exposure to amplified rumbling noise could disrupt a person's ability to think clearly [13-16]. Recent research also points to noise decreasing

dopamine and that means your brain can't control information flow as effectively [17-19]. Basically, excess noise has the same effect as being hit repeatedly on the head [20,21]. Background music facilitates driver performance via increased alertness leading to more focused concentration, or cause distraction placing drivers at greater risk [22-24]. Brodsky and Warren [25], indicate that as the perceptual demands of the primary driving task increased, the effect of secondary music activity was hampered [25].

Experiments in a simulated long-haul flight cabin environment shows that passengers' stress can indeed be significantly reduced through listening to the recommended music playlists [26]. The car cabin is extensively used as a listening environment for various audio programs, such as music, video soundtrack, navigation system instructions, telecommunications, and warning sounds [27,28]. In-cabin wireless networks are attractive in that they enable the passengers to use their own personal equipment during road trips [29-32]. An average time three hours of musical exposure causes the hearing loss of 10-15 dB HL at higher frequencies [33-35]. The use of open as well as semi-open headphones has no influence on hearing damage [33,36,37].

Almost 15% of the investigated young people have their hearing thresholds shifted up at higher frequencies, particularly at 4kHz, which means that they have the first symptoms of permanent hearing damage [33]. An estimated 43% of adults over the age of 65 have hearing loss [38-40]. A study of older adults with hearing loss found that there was a correlation between hearing impairment and driving performance in the presence of distracters that shows older adults with hearing loss had greater difficulty driving safely in the presence of distracters than older adults with normal hearing. The open road is a dangerous place, anyone getting into a car and turning on the ignition has a tremendous responsibility, the life of the driver, passengers, pedestrians and other motorists is in many senses in a heightened state of vulnerability [41-43].

Careful driving requires the engagement of visual and auditory senses to make often informed and, very quick decisions to navigate safely. Hearing loss can greatly impair an individual's ability to hear important safety cues such as a horn honking, a siren, or another vehicle accelerating nearby. Street noise outside the car and the hum of traffic can make it difficult for drivers with normal hearing to detect signals, for those with hearing loss; background noise presents an even greater challenge [44-46]. Hearing loss alone provides a significant safety concern on the road. The aim of this study was to identify the relationships between awareness of the damaging effects of high noise levels, previous exposures to loud sounds, preferences-related to sound levels and knowledge of hearing protection with age, gender, and individual's susceptibility to cochlear damage after noise exposure. This would enhance preventive strategies for noise-induced hearing loss [47-50].

Material and Methods

The research analysis addresses overall noise pollutants in vehicles caused by music. For the data collection the authors of the research prepared questionnaires to collect the relevant data including their preferences while driving. Research participants were selected from academic society members. University students above 18 years old, teachers, and other members of the academic institution were part of the research. All participants were aware of the importance of the data. Interestingly, all respondents were members of academia who understand the importance of qualitative data [51-55].

This study uses a descriptive statistical approach to define meaningful output. The study used data collected by survey as a primary source and used literature reviews as one of its secondary data sources. The sampling method used in this study used a stratified sampling of drivers. The study tries to divide driver members into homogeneous subgroups. A simple random selection is used in each category of drivers. In order to analyse out put the study uses a frequency percentage distribution method. The study uses around 373 numbers of respondents to analyse

the result. From the total number of questionnaires distributed around 0.03% (11) were not returned. These 11 were left blank, as a result, the study uses data from only 362 respondents as an input to analyse the study. Around 96 and 266 of respondents were female and male driver respectively. The study tries to divide the age of respondents into 18-30, 31-50, 51-70 and 71+ [56-59].

In order to address the objective and collect relevant information the questionnaire was introduced to respondents and the research organizers gave a general introduction to the research topic. The questionnaire was interesting and simple to which the respondent could easily answer and focus more on the research itself. Sensitive and personal questions (including personal data) followed, and sensitive questions come at the end [60-65]. The sample is sought according to the willingness of the respondents, i.e., in the group of respondents there is everyone who is willing to participate in the questionnaire survey. In this study the questionnaire was done face to face so there will not be a doubt as to the quality of the collected data. The questionnaires distributed to respondents were politonym (they have more variants of answers). As it was not possible to study the whole population, a so-called representative sample was selected. Due to this diverse sample, the survey results, can be generalized to the whole population. Based on data collected from the respondents the study analyzed, the frequency of male and female respondents; music and noise preference between drivers; age and gender of driver preference to music and noise generated from music in driver cabin [66-70].

Result and Discussion

In this section the study tried to investigate driver music and noise preferences. The study also attempted to define music and noise preferences in driving cabin in the terms of age and sex. In order to analyse driver music and noise preference the study used questionnaires as shown below. The respondent could choose between five alternatives to indicate their musical preference and its volume level while driving. Music and Noise preference clarification:

None: no music or radio while driving

Radio: preferred radio while driving

Modern: Pop, Rock, R and B, Hip Hop, Metal, Blue grass, RAP.

Classic: Jazz, Verdi, Mozart, Puccini, Wagner, Country, Soul, Les Belles Chanson.

No preference: Able to hear Radio or any type of music.

Based on the drivers' response the study tries to analyse the data and filter the output for discussion as shown below:

a) Drivers Gender and Music Preferences

(Table 1) shown below, indicates that music preference based on gender ratio in percent from the total number of respondents.

From the total number of respondents around 26.5% were female, which accounted for 96 respondents, while the remaining 73.5% were male, which accounted for 266 respondents. This shows that most of the drivers in the driving cabin were male in gender. As shown in the (Table 1) above respondent on driver music preference agree that modern (Pop, Rock, R and B, Hip

Hop, Metal, Blue grass, RAP, etc.) music types are preferred both by male and female drivers. These shows from total male and female respondent around 60.15% and 39.58% agree that they prefer modern music. This indicate that most driver preferring modern music (Pop, Rock, R and B, Hip Hop, Metal, Blue grass, RAP, etc.) that causes.

Table 1: Total survey participants music preference Female/Male.

Music preference	Female Total	Ratio [%]	Male Total	Ratio [%]
None	26	27.08	37	13.91
Radio	7	7.29	20	7.52
Modern	38	39.58	160	60.15
Classic	21	21.88	48	18.05
No preference	4	4.07	1	0.38
Total	96	100	266	100

Source: Own analysis

b) Drivers Music Preferences Priority

(Table 2) shown below indicates the total number of respondent drivers which prefer Modern and Classic music respectively. From all respondents around 198 of them preferred modern music in the cabin while driving. As shown in (Table 2)

above respondent agree that modern (Pop, Rock, R and B, Hip Hop, Metal, Blue grass, RAP, etc.) is their first prioritized music and that it is preferred both by male and female drivers. This shows that out of all respondents around 54.7% agree that they prefer modern music.

Table 2: Total survey participants music preferences.

Music preference	Total participants	Ratio [%]	Priority order
None	63	17.4	3
Radio	27	7.46	4
Modern	198	54.7	1
Classic	69	19.06	2
No preference	5	1.38	5
Total	362	100	

Source: Own analysis

c) Female Driver Music Preferences by Age

(Figure 1) shown below indicates that music preference can depend upon the age of drivers. Out of all (96) female driver respondents those with an age of 18-30 highly prefer modern music compared with other age groups. From total respondents around (45.8%), (8.3%), (15.6%) and (30.2%) of respondents were female driver with an age group of 18-30, 31-50, 51-70 and 71+. This shows most of drivers in driving cabin were driver with an age group of 18 - 30. As shown in (Figure 1) above, female driver music respondents' preference by age: driver with an age of 18-30 highly prefer modern music (Pop, Rock, R and B, Hip Hop, Metal,

Blue grass, RAP, etc.) that accounted for 39.6% of female drivers. Drivers aged 31-50 prefer radio, modern and classic music in equal measures, drivers aged 51-70 mostly had equal preferences while above the age of 71+ most had classic music preference but are relatively uninterested in radio. This shows that total female drivers with an age of 51 and above have no preference to music compared to age below 51 drivers. In line with these female drivers with an age of 50 and below prefers modern music. This indicates that age of drivers has their own impact in hearing and preference of music.

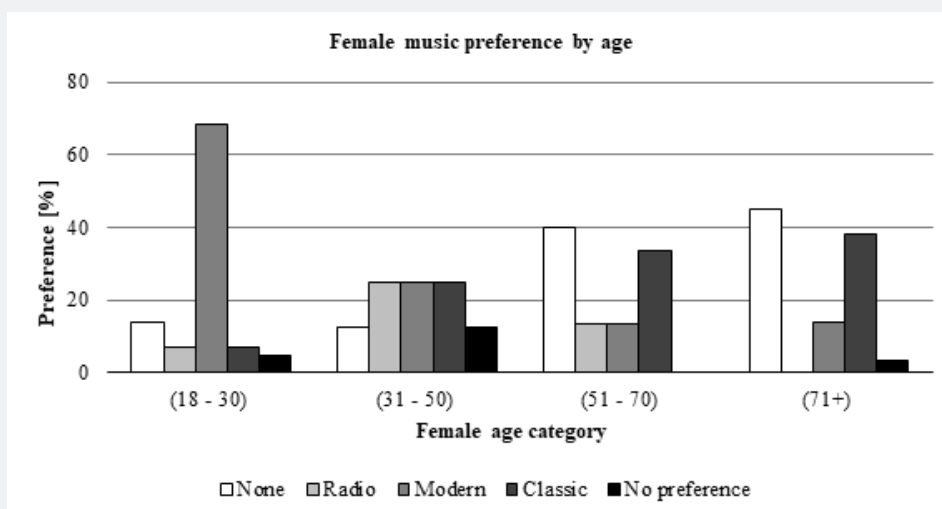


Figure 1: Female music preferences by age.
Source: Own analysis

d) Male Driver Music Preferences by Age

(Figure 2) shown below indicates that the musical preference of male drivers can also depend upon age. From a total of 266 male driver respondents, drivers with an age of 18-30 much prefer modern music compared with other age groups. From total respondents around (47.7%), (11.3%), (15.4%) and (7.5%) of respondents were male drivers with an age group of 18-30, 31-50, 51-70 and 71+.

This shows most drivers in driving cabin were within an age group of 18 - 30. As shown in (Figure 2) above, male driver response for music preference by age: drivers aged of 18-50 much prefer modern music (Pop, Rock, R and B, Hip Hop, Metal, Blue grass, RAP, etc.), which is 55.3%. Whereas male drivers aged 51-70, accounting 8.3%prefer classic music. Those aged 71+ has no music preference but is relatively uninterested in the radio and not selected “no preference”. This indicates that the age for drivers has its own impact in listening and preference of music.

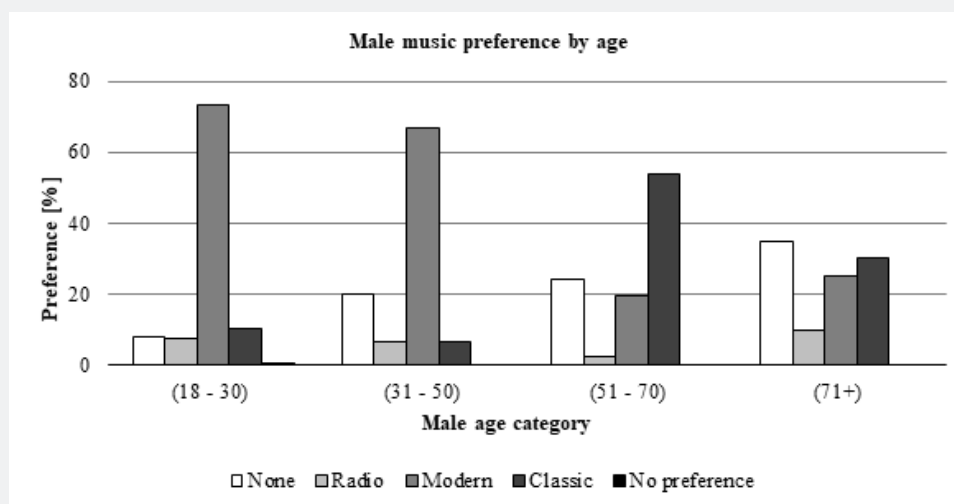


Figure 2: Male music preference by age categories.
Source: Own analysis

e) Preference of Music Noise Level by Driver in line with Gender and Age

Unpleasant music while driving can be considered noise. The question could be raised regarding differences between music

and noise, and when music can become noise. The individual cause of hearing trouble based on age and gender music preference, preference for radio or those without radio or those without preference including those who selected none of all the

alternatives. The relationship between noise and driving safety has not yet been fully explored. A comparison of the effect of noise on the more elderly and the younger in different age categories is shown in (Table 3). The priorities in the music category such

as if, unpleasant music acts like noise and whether strong music acts aggressively on nervous system by, for example, reducing concentration, increasing aggression, etc. are all areas for further investigation.

Table 3: Noise level preference score by Age categories and Gender.

Age category	(years)	18 - 30	31 - 50	51 - 70	71+
Noise level Score	Female	2.43	1.5	1.39	1.9
	Male	2.13	1.55	1.67	1.75

Source: Own analysis

From (Table 3) above; responses on female and male driver noise level preference by age, show that drivers with an age of 18-30 prefer high noise levels generated by music, while drivers aged 31-50 and 51-70 prefer lower noise levels compared to drivers aged 18-30. Drivers with an age of 71 and above prefer a slightly higher volume level compared to drivers aged 31-70. This may be caused by hearing trouble. To compensate for their hearing loss, they prefer music with a higher volume level. This shows that driver with an age of 71 and above probably have a reduced hearing capability. This may be caused by hearing trouble connected to the age of the driver. To cope with hearing loss, they prefer music with a high-volume level. This indicates that age for drivers has its own impact on hearing and music preference. As shown in table 3 female drivers with an age of 18-30 prefer music with high a volume level like male drivers with an age of 18-30. This shows that the preference of level of music volume is basically related to the gender of the driver.

Good hearing is essential to good driving. But drivers with hearing loss needn't necessarily hang up their keys, instead they should seek help. If you suspect you or a loved one has hearing loss, see an audiologist for an audiological evaluation. If you have diagnosed hearing loss, see your audiologist annually to monitor for changes. If hearing aids are prescribed, they should always be worn when driving. Finally, make responsible decisions: if your senses are impaired, your driving ability can suffer, especially for older adults. When on the road, be smart, be courteous, and remember, your safety and that of others is at stake.

Conclusion

Music and volume vary between drivers in the driving cabin. Drivers prefer music type and its volume level based on age and gender. The study used qualitative data to analyse the result. The study used questionnaires as primary data and literature review as a secondary data source. The study collected 362 respondents' questionnaires driver of different nationalities to define preference of music and level of volume. The study collected data randomly from drivers. From total respondents

96 and 266 respondents were female and male respectively. To analyse the data, the study used a descriptive analysis approach using a frequency percentage distribution method. The study results show that from the total number of respondents around 26.5% were female respondents while the remaining 73.5% were male respondents. In line with music preference from total male and female respondent around 60.15% and 39.58% agree that they prefer modern music (Pop, Rock, R and B, Hip Hop, Metal, Blue grass, RAP, etc.) respectively. From all music preference respondents agreed and prioritize modern music as their primary choice. From whole respondent group around 54.7% much prefer modern music.

In line with age of preference, from total respondent group around (59.9%) (10.5%), (15.5%) and (13.5%) of respondents were male and female drivers with an age group of 18-30, 31-50, 51-70 and 71+ respectively. This shows most of female drivers in driving cabin were drivers within an age group of (18 - 30). Respondents on female driver music preference by age: drivers with an age of 18-30 much prefer modern music (Pop, Rock, R and B, Hip Hop, Metal, Blue grass, RAP, etc.). Respondents on female and male driver music level preference by age show that drivers aged 18-30 prefer a high-volume level generated by music. Not only drivers aged 18-30 prefer louder music, drivers aged 71 and above relatively prefer a higher volume level generated due to music while driving compared drivers aged of 31-70. This suggests that drivers over the age of 71 probably have a reduced hearing capacity. This indicates the age of drivers has its own impact on hearing and music preference. The preference of music level is not only related to driver age and gender.

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References

1. E Scott (2020) How Noise Pollution Might Cause Increased Stress Levels. California: DotDash (verywellmind).
2. Knvul Sheikh (2018) Noise Pollution Isn't Just Annoying. It's Bad for Your Health. BrainFacts/SfN.
3. Thomas M, Mette S, Frank S, Erwin S, Sebastian S, et al. (2018) The Adverse Effects of Environmental Noise Exposure on Oxidative Stress and Cardiovascular Risk. *Antioxid Redox Signal* 28(9): 873-908.
4. DT Driver Training Ltd (2021) What effect does noise have on your concentration? Driving Tests, New Zealand.
5. Saba K, Ali D, Mir SY, Leila O, Mitra R (2015) The effects of occupational noise on blood pressure and heart rate of workers in an automotive parts industry. *ARYA Atheroscler* 11(4): 215-219.
6. Rajeshwar B, Rajalakshmi R, Nitin AJ, Umadevi SV (2016) Hearing Impairment and High Blood Pressure among Bus Drivers in Puducherry. *J Clin Diagn Res* 10(2): CC08-CC10.
7. MAW Andrews, Michael R (2010) How does background noise affect our concentration? Greensburg: Scientific American Mind, USA.
8. Ragnar R (2004) Physiological aspects of noise-induced stress and annoyance. *Journal of Sound and Vibration* 277(3): 471-478.
9. Alva Kate, Enoksson Wallas (2019) Health effects of Road traffic noise in Childhood and Adolescence. Karolinska Institutet.
10. Joyce Cohen (2016) When even soft noises feel like a knife to the eardrums. STAT.
11. Andrea CL, Vanessa GO, Patricia MBL, Jose RPL, Cibele CS (2012) Prevalence of noise-induced hearing loss in drivers. *Int Arch Otorhinolaryngol* 16(4): 509-514.
12. NHS (2019) Noise sensitivity (hyperacusis). British Tinnitus Association.
13. University of Minnesota (2021) Barriers to Effective Listening. M Libraries.
14. JH Austin, MD (2009) *Selfless Insight*. London: The MIT Press, UK.
15. University of Waterloo (2021) *Effective Communication: Barriers and Strategies*. The Centre for Teaching Excellence.
16. ER Service (2021) *Barriers to Effective Communication*. Lumen Candel.
17. Catalina V-B, Guillermo VC, D Perez-Gonzalez, Manuel SM (2020) Dopamine modulates subcortical responses to surprising sounds. *Plos Biol* 18(6): e3000744.
18. Hugo JO, David CG, Ernestina HG, Gerardo BM (2016) The Role of Dopamine and Its Dysfunction as a Consequence of Oxidative Stress. *Oxid Med Cell Longev* 2016: 9730467.
19. Jingjing SW, Eunyoung Y, Marco M, Hamad J, Amanda ML, et al. (2020) Sound exposure dynamically induces dopamine synthesis in cholinergic LOC efferents for feedback to auditory nerve fibers. *ELife* 9: e52419.
20. Mary AK, Laura LW (2018) *Recovering from Mild Traumatic Brain Injury*. Washington D.C: brainline, USA.
21. UTA Office of Public Affairs (2016) *Conclusion: How They can Affect you now and later*. Health University of UTA, USA.
22. Ayca BU, Dick de W, Kai E, Linda S (2013) Driving with music: Effects on arousal and performance. *Transportation Research Part F: Traffic Psychology and Behaviour* 21: 52-65.
23. Bob Parker (2002, 09 30).
24. Huiying W, NN Sze, Qiang Z, Sangen H (2019) Effect of Music Listening on Physiological Condition, Mental Workload, and Driving Performance with Consideration of Driver Temperament. *Int J Environ Res Public Health* 16(15): 2766.
25. Brodsky W (2018) A Performance Analysis of In-Car Music Engagement as an Indication of Driver Distraction and Risk. *Transportation Research Part F - Traffic Psychology and Behaviour* 55: 210-218.
26. Hao L, Jun H, Matthias R (2015) Follow your heart rate controlled music recommendation for low stress air Travel. *Interaction Studies* 16(2): 303-339.
27. Cheer et al. (2013) Design and Implementation of a Car Cabin Personal Audio System. 61(6): 412-424. AES E-LIBRARY, UK.
28. Cheer, Jordan, Elliott, Stephen J, Simon G, (2013) Design and Implementation of a car Cabin Personal Audio System. *Journal of the Audio Engineering Society* 61(6): 412-424.
29. Cheng L, Fan B, Daniel DS (2014) Radio Channel in a Minivan's Passenger Cabin: Preliminary Ray Tracing Simulations. *IEEE Antennas and Propagation Society International Symposium*.
30. Livio D, Luca B, Fabio L, Alessandro I, Carlo B (2007) An Analytical Model of Microcellular Propagation in Urban Canyons. *Genova: Vehicular Technology Conference, Italy*.
31. Yochai B (2004) Sharing Nicely: On Shareable Goods and the Emergence of Sharing as a Modality of Economic Production. *The Yale Law Journal Company* 114(2): 273-358.
32. Xiangning Liao (2020) Design of a Loudspeaker Array for Personal Audio in a Car Cabin. *Journal information, China*.
33. A Dobrucki, Maurycy K, Bartlomiej K (2013) Preliminary Study on the Influence of Headphones for Listening Music on Hearing Loss of Young People. *Archives of Acoustics* 38 (3): 383-387.
34. Debora L, Claudia G de OG, Adriana B de ML, Angela R, Juliana de C (2014) Music students: conventional hearing thresholds and at high frequencies. *Braz J Otorhinolaryngol* 80(4): 296-304.
35. Yost (2000) *Hearing Loss: Determining Eligibility for Social Security Benefits*. National Academic Press, USA.
36. Andrzej D, Maurycy JK, Bartlomiej K (2017) Various Aspects of Auditory Fatigue Caused by Listening to Loud Music. *IntechOpen*.
37. Stephen E, Claes M, Kim K (2018) Headphone listening habits, hearing thresholds and listening levels in Swedish adolescents with severe to profound HL and adolescents with normal hearing. *Int J Audiol* 57(10): 730-736.
38. (2012) Hearing loss in persons 65 years and older based on WHO global estimates on prevalence of hearing loss. *Mortality and Burden of Diseases and Prevention of Blindness and Deafness*. World Health Organization (WHO).
39. Kathleen EB, Margaret IW (2014) Hearing Loss in an Aging American Population: Extent, Impact, and Management. *Annu Rev Public Health* 35: 139-152.
40. Dayna SD, Karen JC, Barbara EKK, Ronald K, Terry LW, et al. (2003) The Impact of Hearing Loss on Quality of Life in Older Adults. *Gerontologist* 43(5): 661-668.
41. A Persson (2008) Road traffic accidents in Ethiopia: Magnitude, causes and possible interventions. *Ethiopia*.
42. Atsbeha G (2014) Addis Ababa Road traffic accident study and possible engineering solution: Case study of Akaki Kaliti sub-city roads. *Addis Ababa*.
43. Baraldi (2014) *Noise and Health*. 16(73): 350-360.

44. CSB Galasko (1986) Long Term Disability Following Road Traffic Accidents. Department of Transport. Southampton: Printers of Southampton, USA.
45. Damen H (2014) Road traffic accident: A major public health problem in Ethiopia 28(1).
46. Debela D (2019) Road Traffic Accident in Ethiopia from 2007/08-2017/18 (Since Ethiopia Millennium) 2(2): 20-29.
47. Disability, Sf (2020) Temporary Disability. USA: University of Michigan.
48. Fralex (2005) Permanent Disabilities. The Free Dictionary, USA.
49. Louise H, Joanne W, Alex C, Philippe L, Ralph M (2010) Hearing Impairment Affects Older People's Ability to Drive in the Presence of Distracters. J Am Geriatr Soc 58(6): 1097-1103.
50. Hensley Legal Group (2020) Three Types of Disability Common after a Car Accident.
51. HT Correspondent (2019) 30% accident survivors have to live with disability. Hindustan times.
52. Janet Quinn (2015) Education for Children with Disability in Ethiopia. The Borgen Project, USA.
53. Jingjing SW, Eunyoung Y, Marco M, Hamad J, Amanda ML, et al. (2020) Sound exposure dynamically induces dopamine synthesis in cholinergic LOC efferents for feedback to auditory nerve fibers. ELife 9: e52419.
54. Jordan Cheer, Stephen J Elliott (2013) Design and implementation of a personal audio system in a car cabin. University of Southampton: The Journal of the Acoustical Society of America 133(5): 3251.
55. Lamance K (2002) Total vs. Partial Disability. Legal Match.
56. Lydia J, Richard C, (2018) Road accident casualties in Britain and the world.
57. Macrotrends (2020) Ethiopia Death Rate 1950-2020.
58. Merriam Webster (2020) Definition for Disability. Disability.
59. Mohammed S, Aklilu A, Fikre E, Engida Y (2015) Injuries characteristics and outcome of road traffic accident among victims at adult emergency department of Tikur Anbessa specialized hospital, Addis Ababa, ethiopia: a prospective hospital based study. BMC Emerg Med 15: 10.
60. Murad Mohammed (2011) Cost of Road Traffic Accident in Ethiopia. Addis Ababa: AAU Institutional Repository, Ethiopia.
61. Teferi A, Samson G (2019) Magnitude of road traffic accident related injuries and fatalities in Ethiopia. PLoS One 14(1): e0202240.
62. United Nation (UN) (2017) United Nations Convention on the Rights of Person with Disability. CRPD.
63. University of Minnesota (2021) Barriers to Effective Listening. M Libraries.
64. Ursula Miller (2016) Ethiopia Country Strategy 2016-2020. Light for the World International.
65. Warren B (2001) The Effects of Music Tempo on Simulated Driving Performance and Vehicle Control. Transportation Research Part F: Traffic Psychology and Behaviour 4(4): 219-241.
66. World Bank (WB) (2018) Poverty and Equity Data Portal. WB, Ethiopia.
67. World Bank/IMF (2003) Final Report of IMF/World Bank Economic Analysis and Forecast on Africa. Network.
68. (2020) Fact sheets on sustainable development goals: health targets, Road Safety. Europe: World Health Organization.
69. (2020) Road Traffic Injuries. Geneva: World Health Organization.
70. (2020) Ethiopian Population. Worldometer.



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