

Bridging the Gap between Transport Availability and Safety: A Case Study on Africa

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Abstract:- This Research Papers focuses primarily on highlighting the prominent gap between Transport availability and its safety in the African Sub-Continent. To begin with, the initial data regarding the current situation of Transportation in Africa were derived from Published Research Papers and this data was then sorted into groups to carry out detailed analysis followed by graphical representation of the observed results. The Methodology used in the sorting process and the conclusions drawn are dealt in detail in the latter part of this paper. The Results expressed in form of graphs are also attached for easier understanding and comprehension of the readers.

I. INTRODUCTION

For long the African nations, especially the Sub Saharan countries have suffered from a high mortality rate resulting from Road Accidents and deaths due to high level of pollution from vehicles on road. In this paper we have tried to present a review report on the African nations which have a high risk associated with Transportation and regions which have been neglected by researchers and need serious attention.

A total of 196 Research papers were found to be in agreement with our search criteria for this report from all published Papers pertaining to African Transport and Safety over the past 26 years. These papers were then downloaded and scrutinized carefully and coded accordingly to draw meaningful conclusions. The coding pattern used has been described in detail in the Methodology section of this paper. The category wise breakdown of Papers was as follows: **Pollution References-36**

RTI References-123

Active Transport References-40

II. METHODOLOGY

The Research Papers were downloaded from online open sources viz Google Scholar, Springer etc. The keywords used included: “African Road Traffic Injury Studies”, “Active Transportation in Africa”, “Vehicular Pollution in African Nations” etc. The downloaded Research Papers were then coded according to the below mentioned pattern:

➤ *Investigators:*

- Local African Researchers
- 2-Foreigner Researches

➤ *Type:*

- Hospital Based Experimental Study
- Secondary Study on Retrospective Data 3-Non-Hospital Based Experimental Study

➤ *Study:*

- Primary Study
- Review

➤ *Intervention:*

0-Paper gives General Solutions 1-Paper gives Specific Solutions

The Analysis was carried out using Microsoft Excel Software.

III. YEAR-WISE PAPER DISTRIBUTION

The following graphs represent the number of papers published each year for each of Sub Categories viz RTI, Pollution and Active Transport.

A. RTI Papers:

An observation of the graph shows that a maximum of 22 papers were published in the year 2017, also the number of papers have shown a increasing trend with passing years, However there is a decline in the recent years (2018 and 2019) probably because these papers are quite new and have not been made available online yet, further the year 2019 is still on the go and new research papers shall be added as the year passes by.

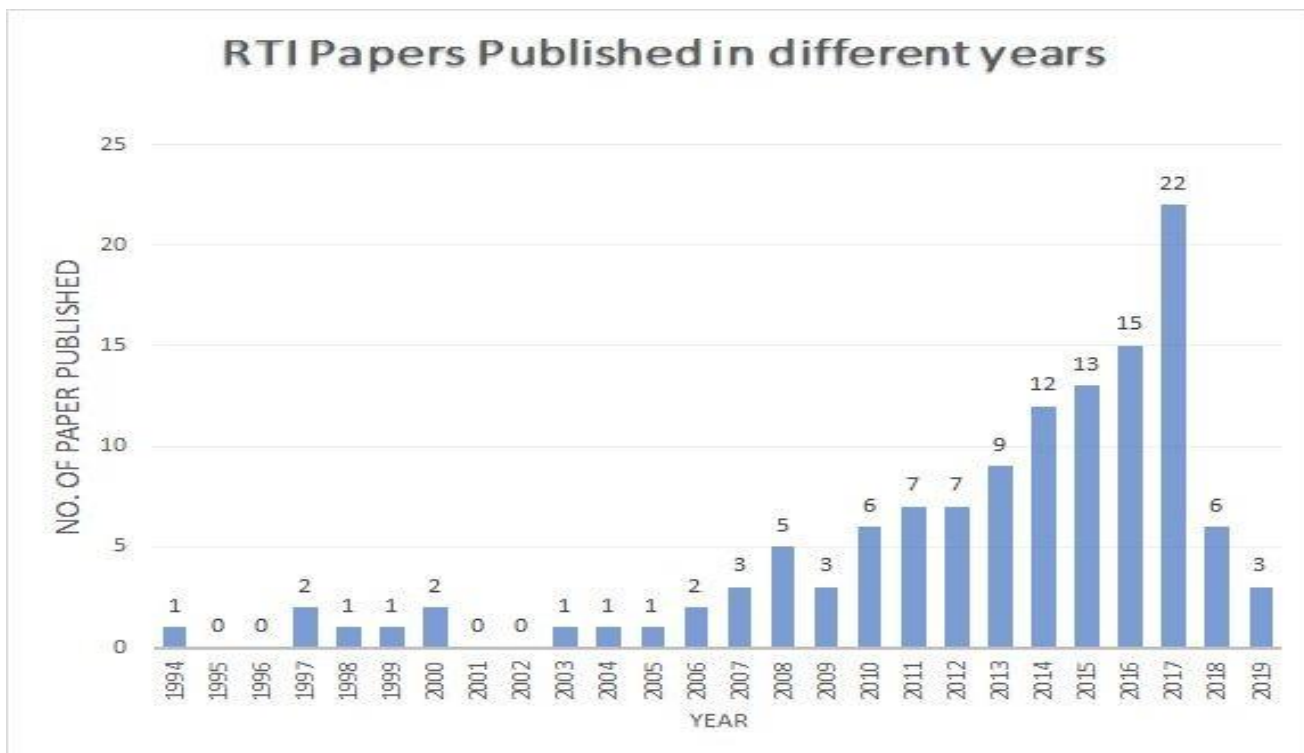


Fig 1

B. Pollution Papers:

A maximum of 7 papers were published in the year 2011, with a sharp decline in the year 2012 the number of

papers has remained fairly constant for the successive years around 3-4 papers/year.

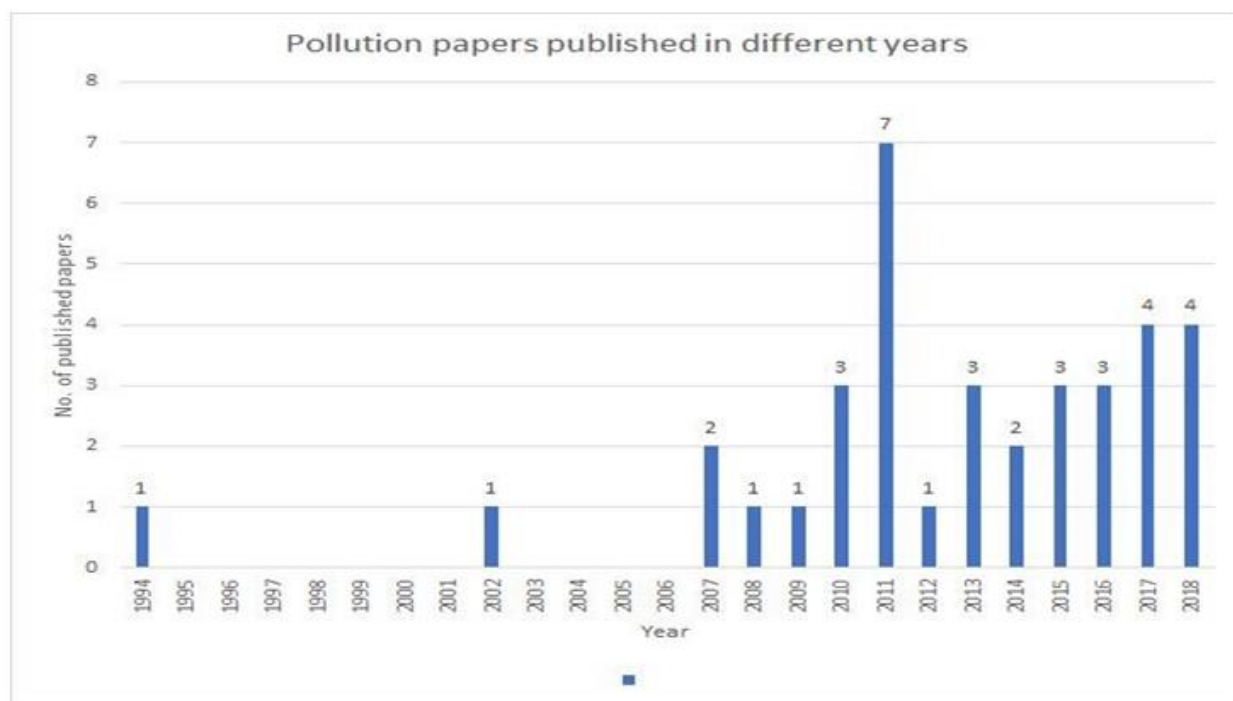


Fig 2

C. Active Transport Papers:

A maximum of 7 Papers were published in the year 2017 with 6 papers each in the neighbouring years. Due to the small sampling size the distribution has become

scattered with few papers showing zero published papers. Also the year 2019 has only 1 paper as new research papers shall be added as the year passes by.

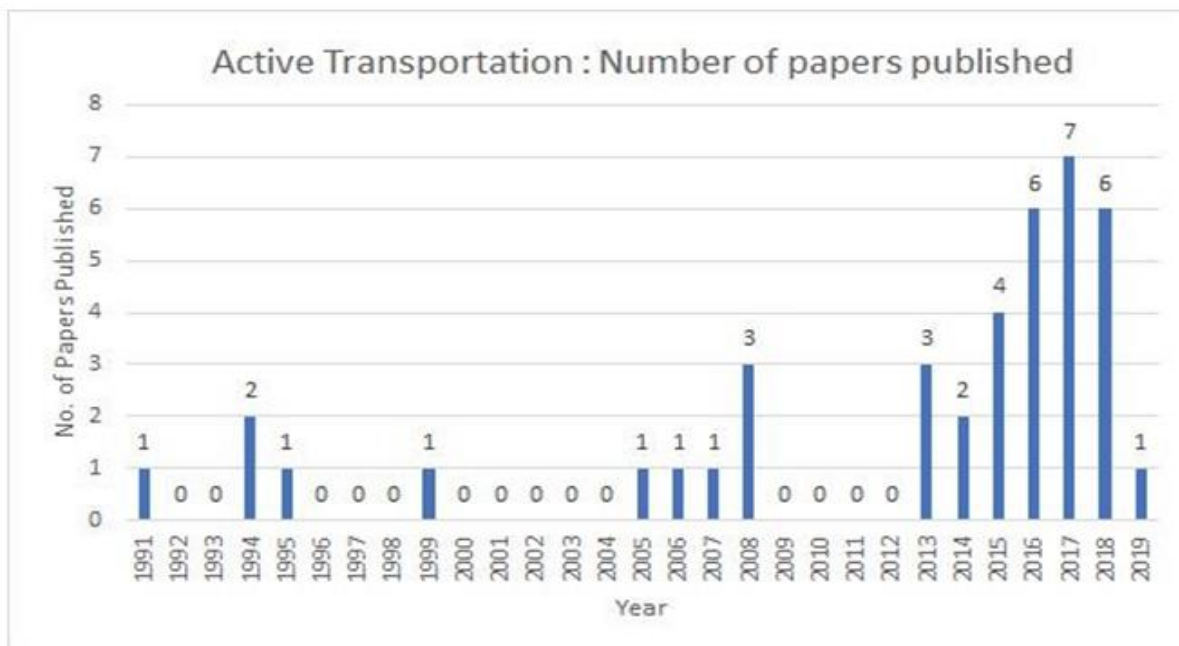


Fig 3

IV. COUNTRY-WISE PAPER DISTRIBUTION

For all the three RTI, Pollution and Active Transport Papers South Africa emerged as the leading nation in terms of research being carried out with 25% share in RTI research 26% share in Pollution related research and 35% in Active Transportation.

It is important to note that in case of RTI papers about 15% of research was carried out on a global scale while for pollution related studies the global share was as low as 6% and around 5% for Active Transport studies. The other nations had smaller share which can be interpreted from the pie charts shown below.

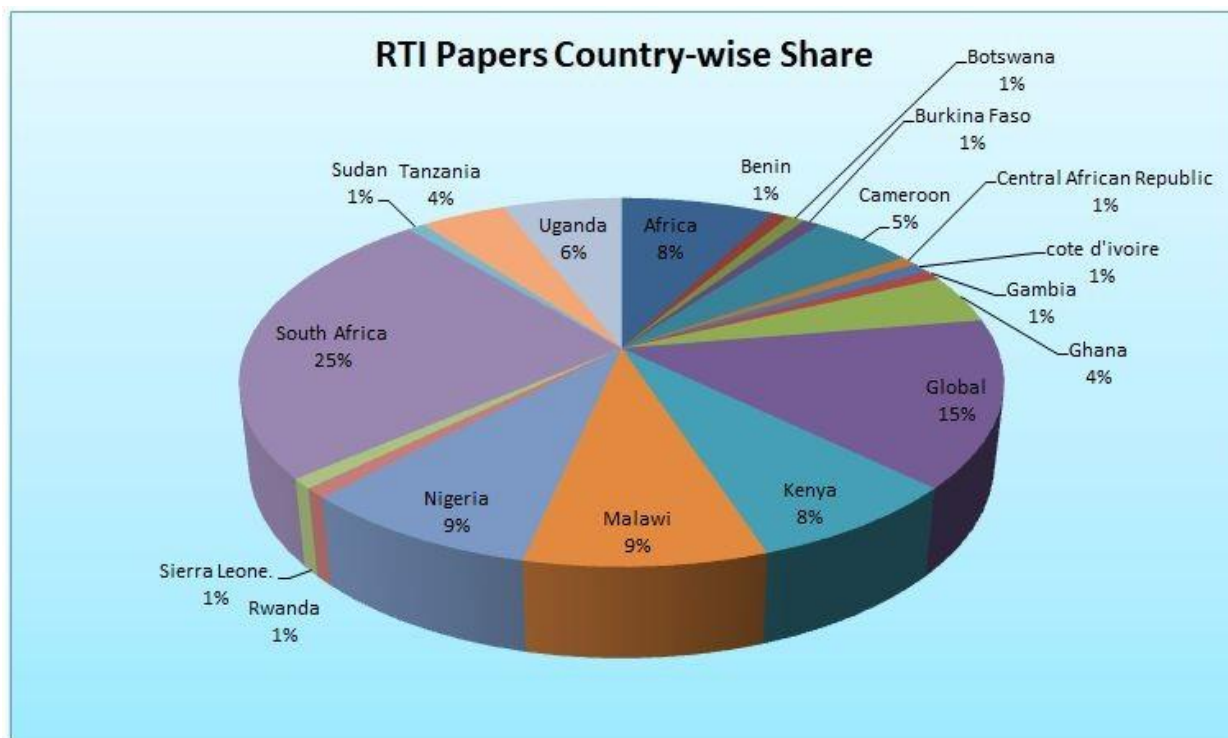


Fig 4

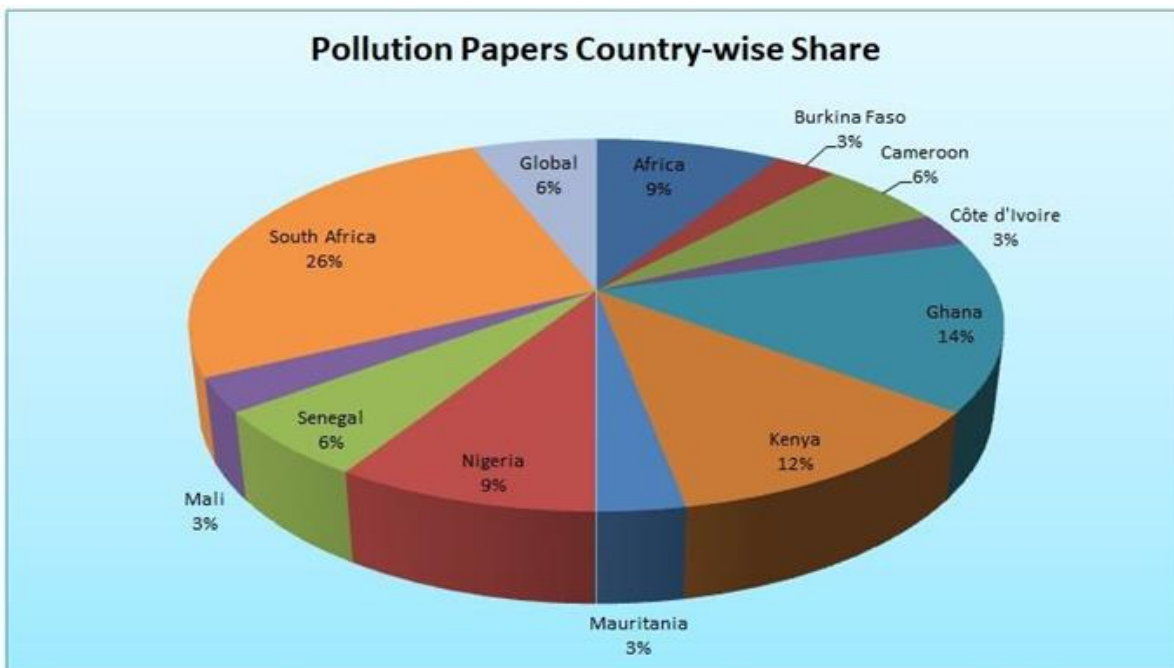


Fig 5

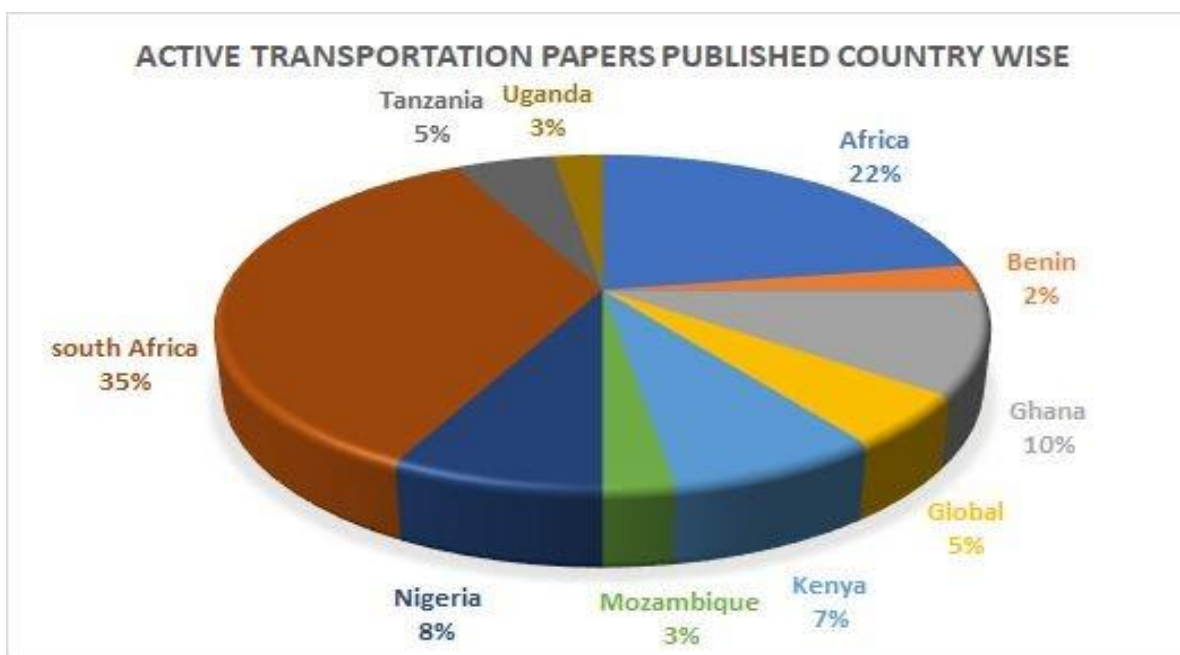


Fig 6

V. INVESTIGATOR BASED ANALYSIS

A. RTI Papers:

In most of the years the local researchers dominated

over the foreign ones except for 2008 when 80% of papers were from foreign sources, year 2012 having foreign share of 57% and the years 1997,200,2006 and 2018 when the share was 50-50 % each.

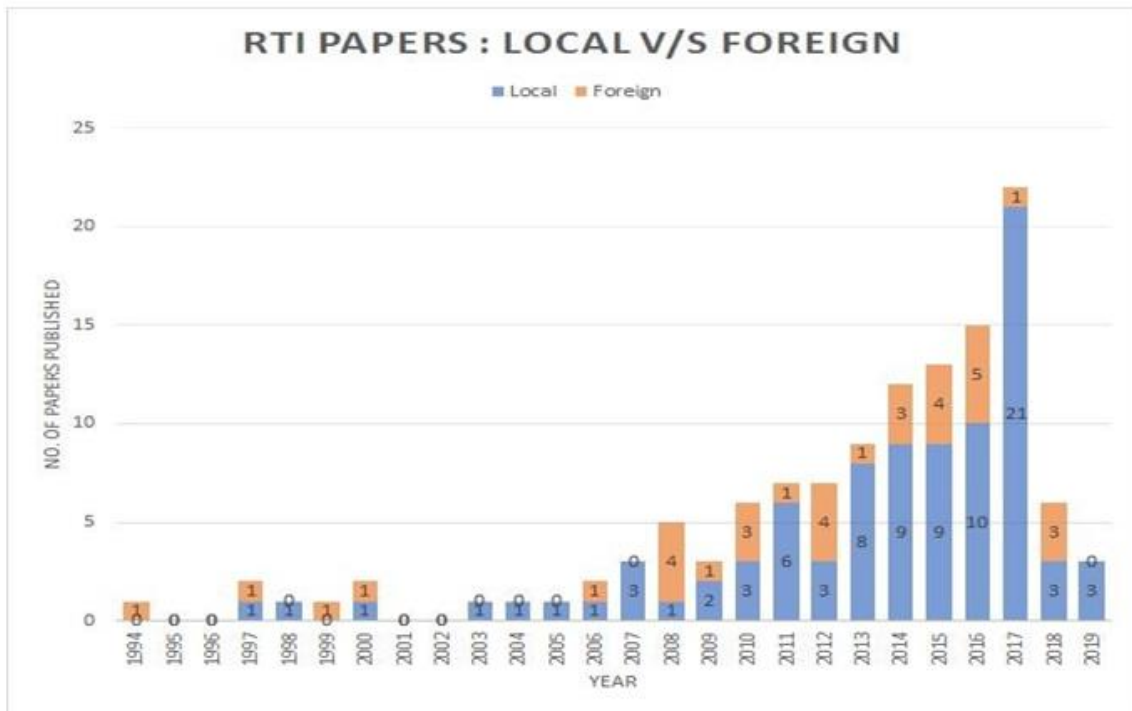


Fig 7

B. Pollution Papers:

Similar to the previous case Local researchers dominated over the Foreigner ones except for the years

2002 and 2013 when the papers published were entirely of Foreign Authors.

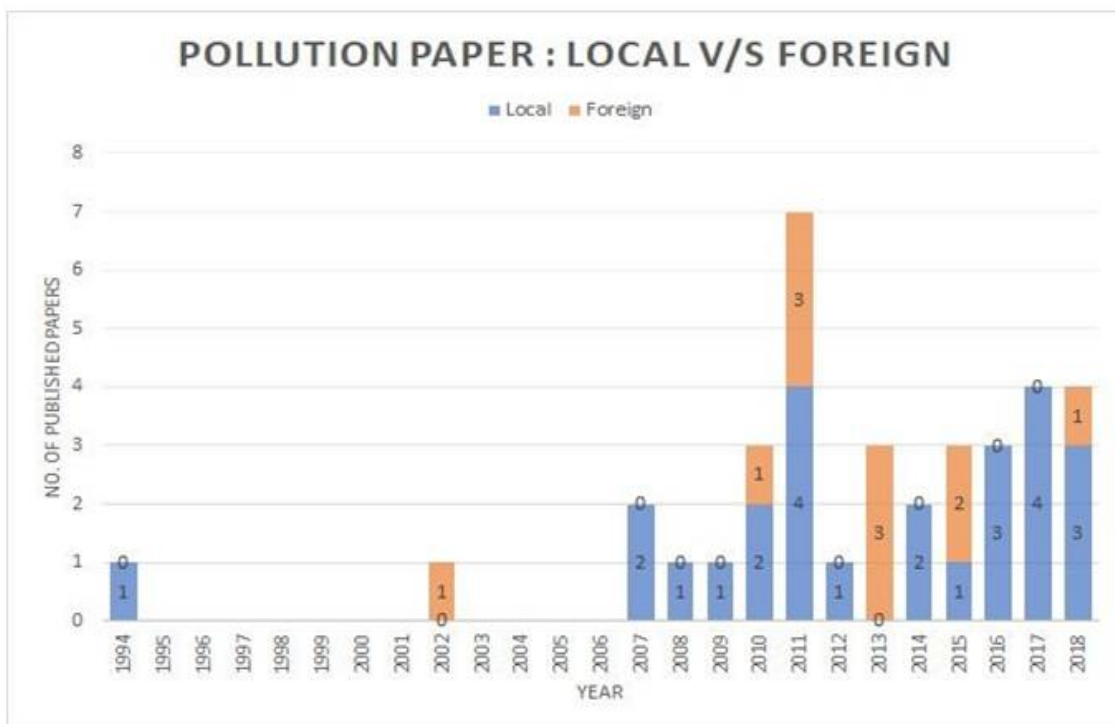


Fig 8

C. Active Transport Papers:

For the latter part of the sample years after 2004, the local research papers dominated over the foreign

ones. However for the earlier years the foreign Researchers clearly outnumbered the local ones. Also the year 2018 saw a larger share of foreign studies.

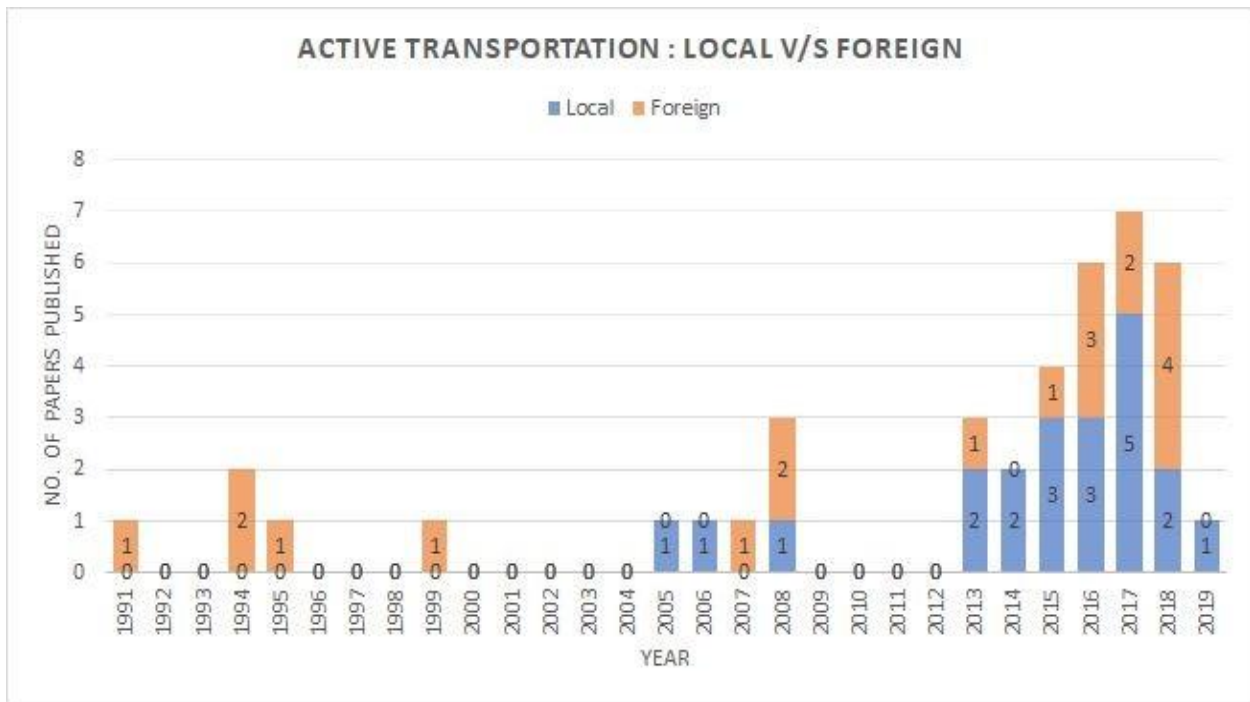


Fig 9

VI. TYPE-WISE DISTRIBUTION OF PAPERS

- ❖ Hospital Based Experimental Study
- ❖ Secondary Study on Retrospective Data 3-Non-Hospital Based Experimental Study

A. RTI Papers:

The Codal meanings have already been explained in the introductory part of the report. Since RTI papers focused

mostly on Injury prevention, Type1 and Type2 were the dominant type of studies while Type3 involving Non Hospital Based Work were limited to 1 or 0 in most of the years (2 in 2007). We can also conclude that Type 2 papers dominated in the early years and in the latter part starting from the year 2013 the papers were mostly Type 1. The overall Paper distribution shows that 51% of total papers were Type2 followed closely by Type1 having a share of 41% and Type3 papers having a small share of 9%

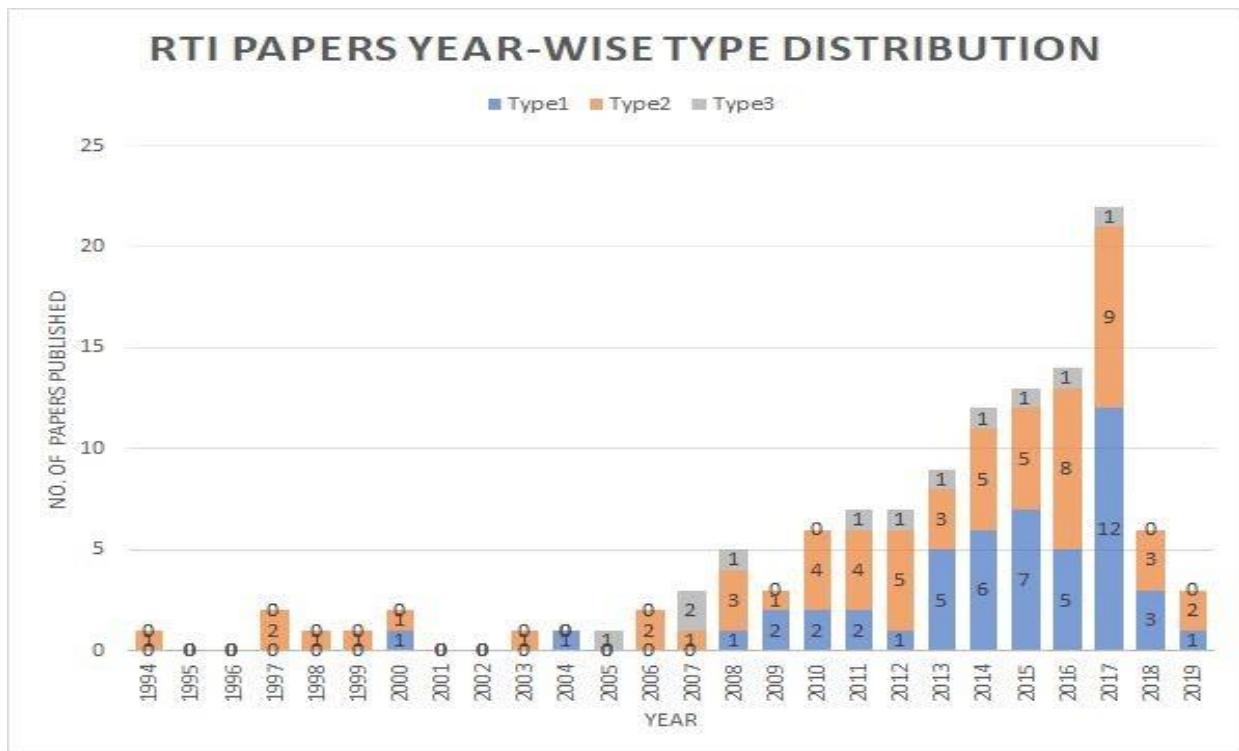


Fig 10

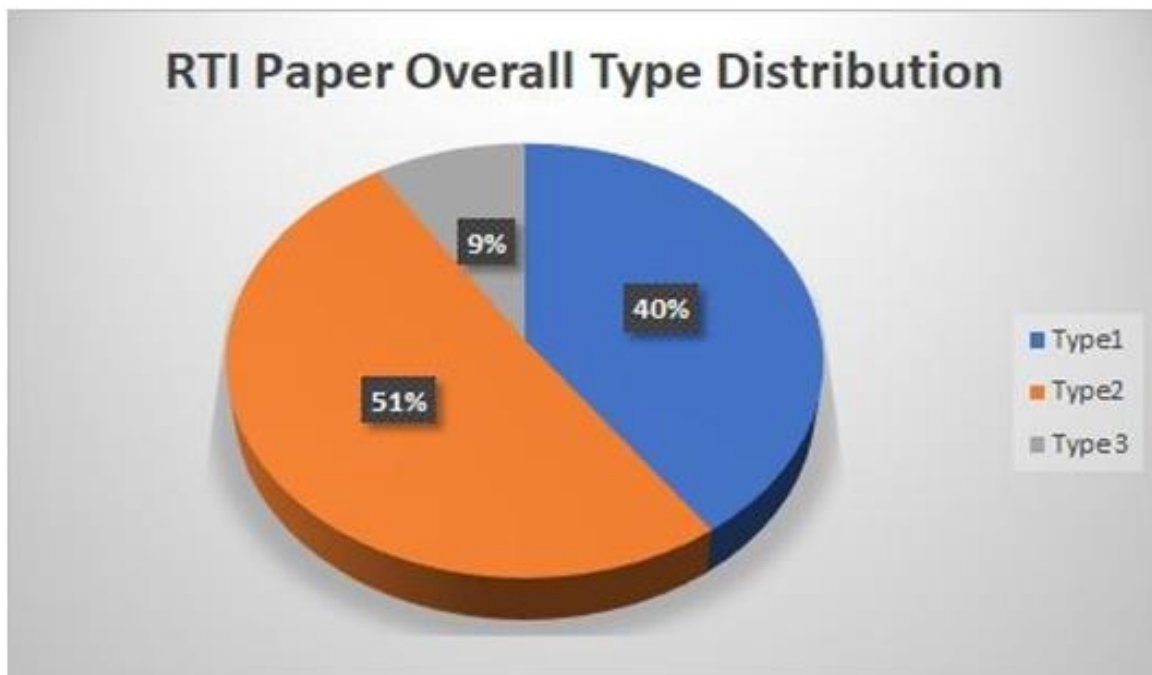


Fig 11

B. Pollution Papers:

Type 1 papers were found to be 0 for every year as studies related to pollution were carried out mostly in the city region rather than closed Hospital Buildings. Clearly

the Type3 papers focusing on Non-Hospital Based Research Work dominated for almost every year except for the years 2002,2013 and 2016.

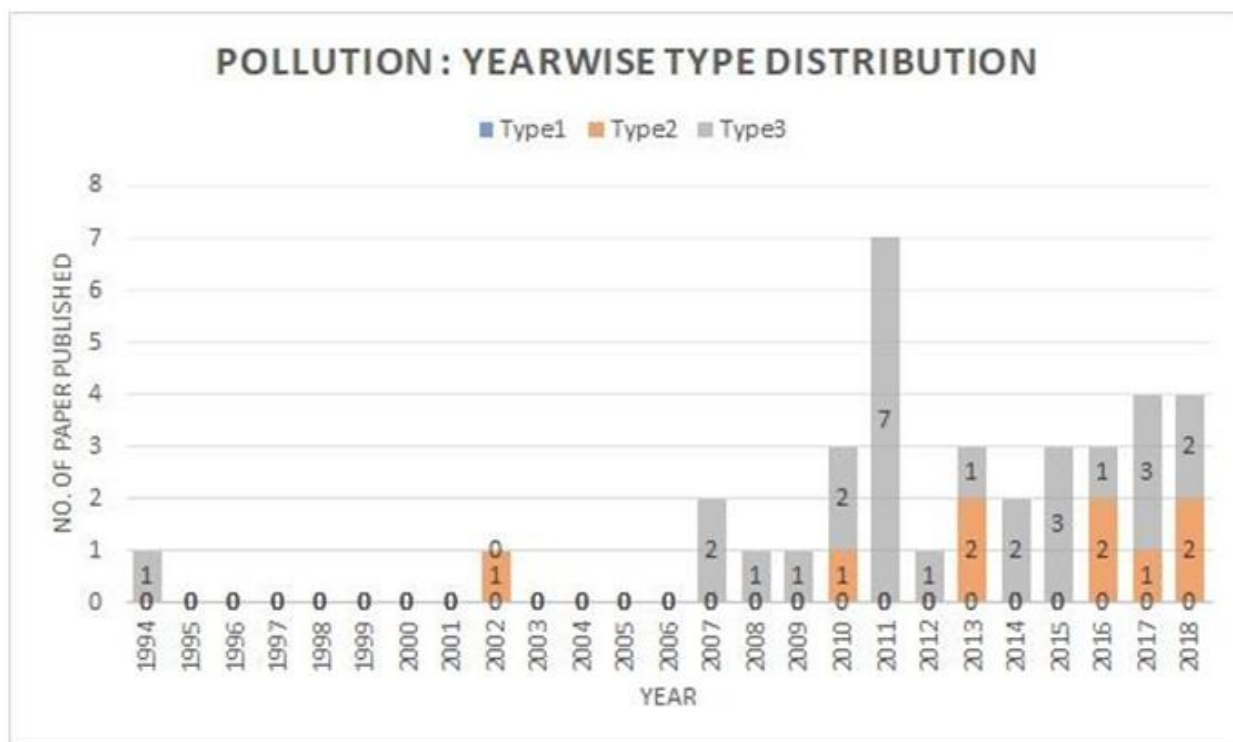


Fig 12

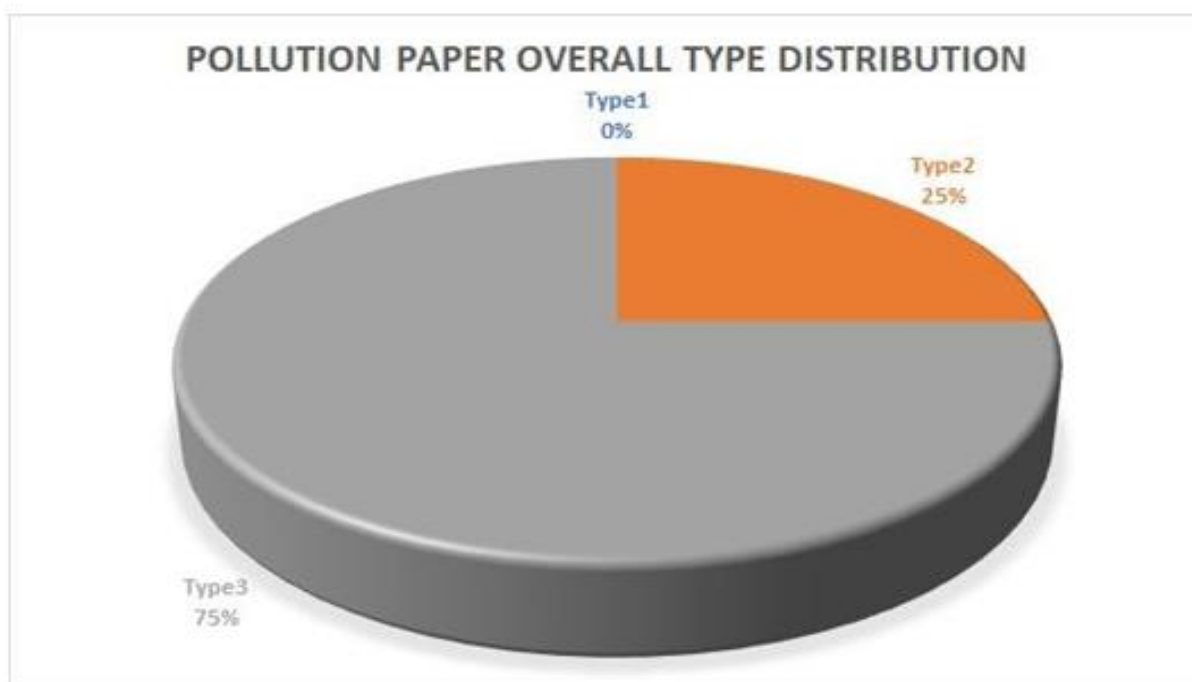


Fig 13

C. Active Transport Papers:

Type 1 papers were found to be 0 for every year as studies related to active transport were carried out mostly

on the roads in the city region rather than closed Hospital Buildings. Type 3 research papers dominated over the years except for the year 2018 when Type 2 papers were more.

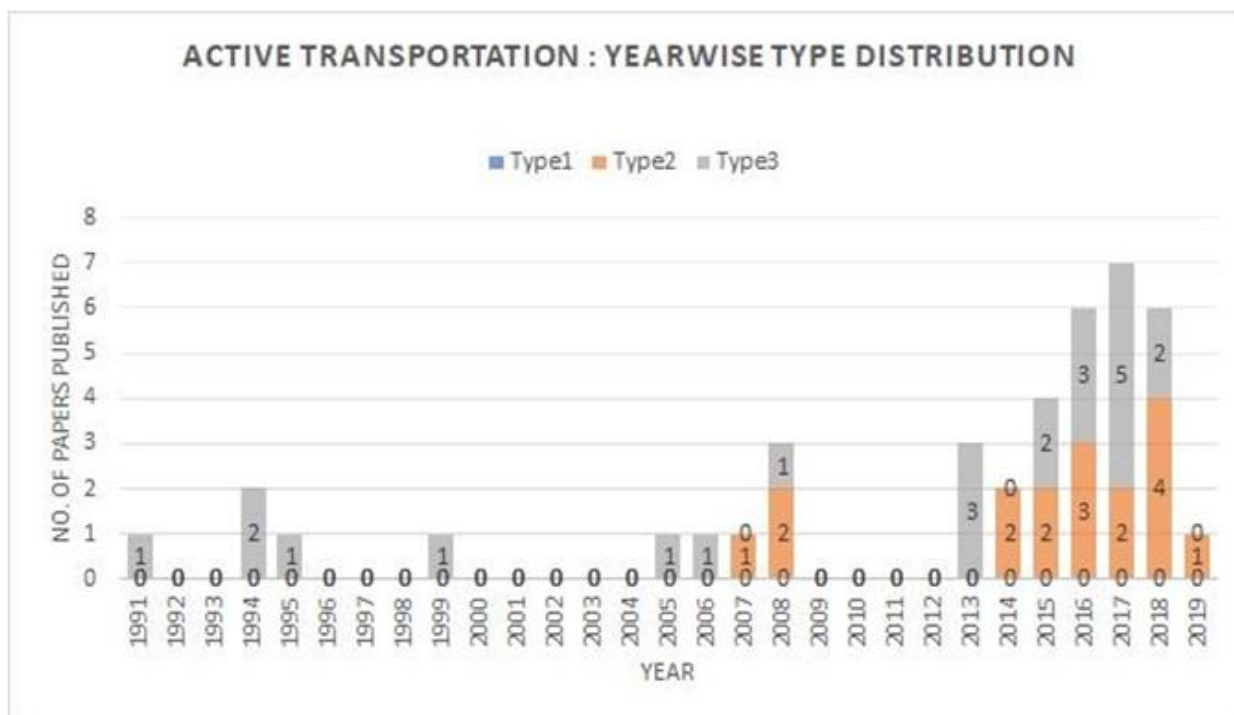


Fig 14

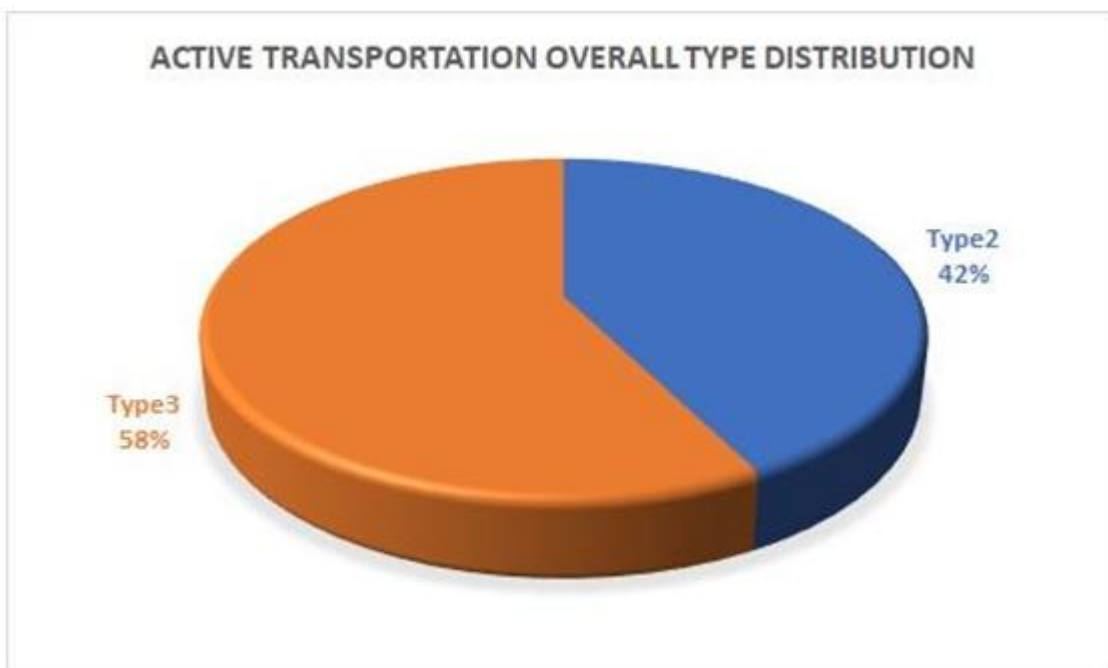


Fig 15

VII. STUDY-WISE ANALYSIS

- ❖ Primary Study
- ❖ Review

A. RTI Papers:

In every year the primary study papers dominated over the Review papers which can be easily seen in the column chart shown below. The overall distribution shows 77% papers were primary and 23% papers were review.

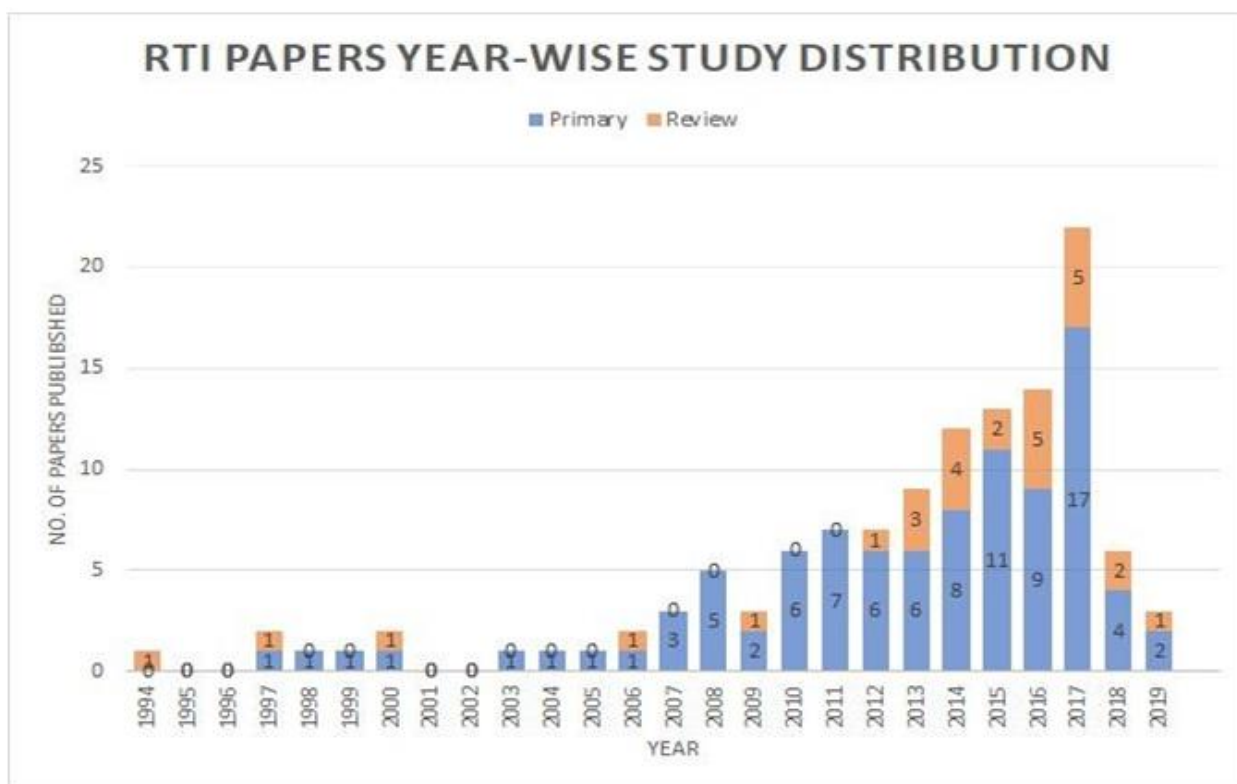


Fig 16

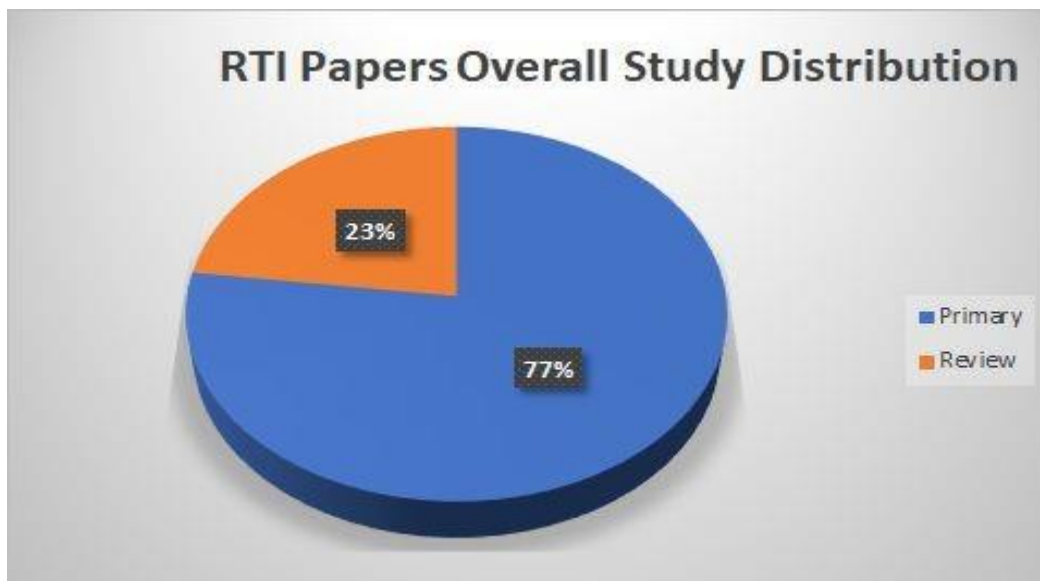


Fig 17

B. Pollution Papers:

A close observation of the column chart below shows that the papers were mainly of primary study for most of the observation years except for the year 2013 when the

review based study dominated over the primary research papers. The overall paper distribution show that 86% of the papers were primary research based and remaining 14% were reviewed studies.

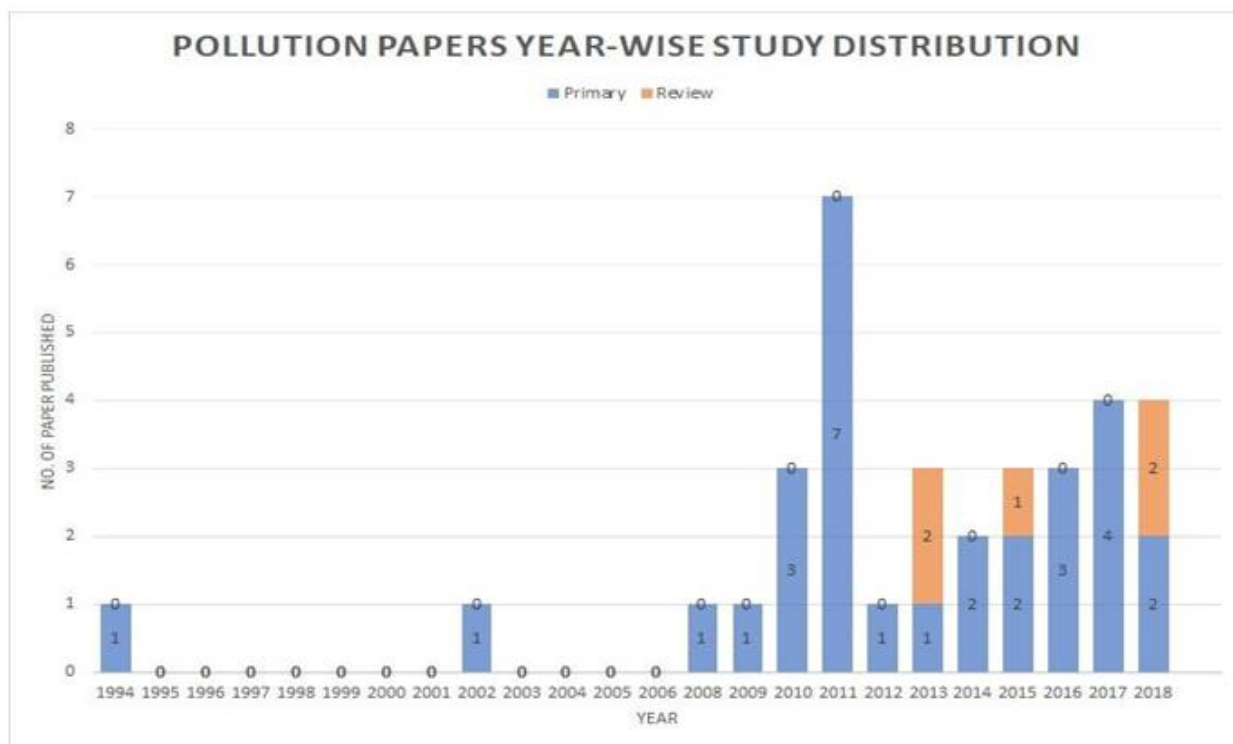


Fig 18

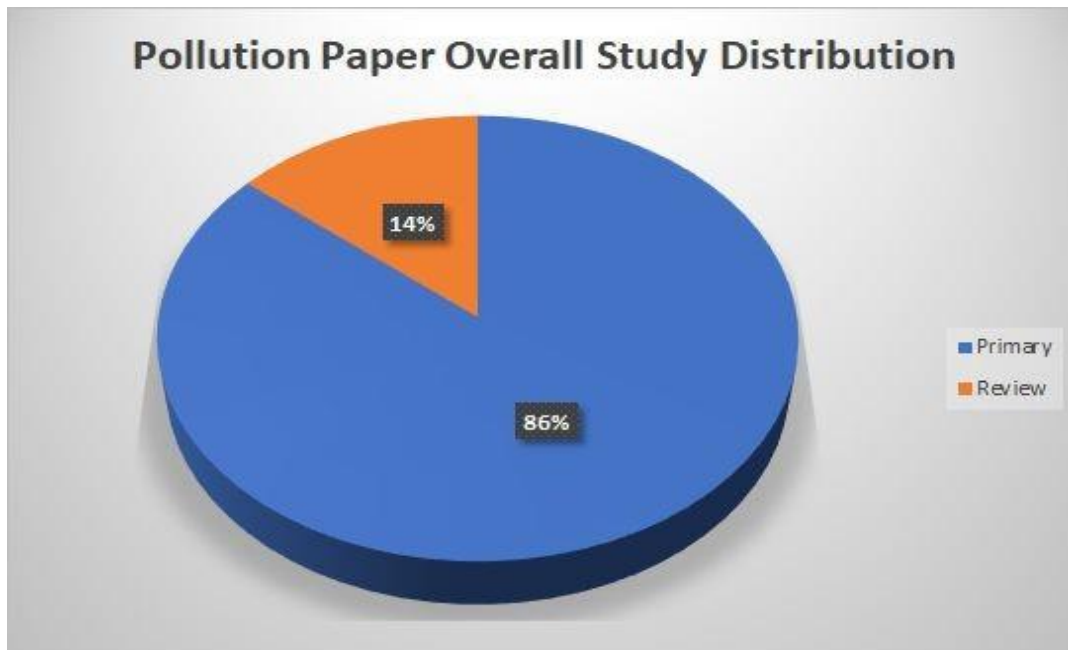


Fig 19

C. Active Transportation Papers:

The column chart below clearly shows that the papers were mainly of primary study for most of the years except for 2007 when only one paper was published which was of

reviewed nature. Also years 1994 and 2018 saw equal share of both primary and reviewed papers. The Overall paper distribution indicates that 75% of papers were primary studies while 25% were reviewed.

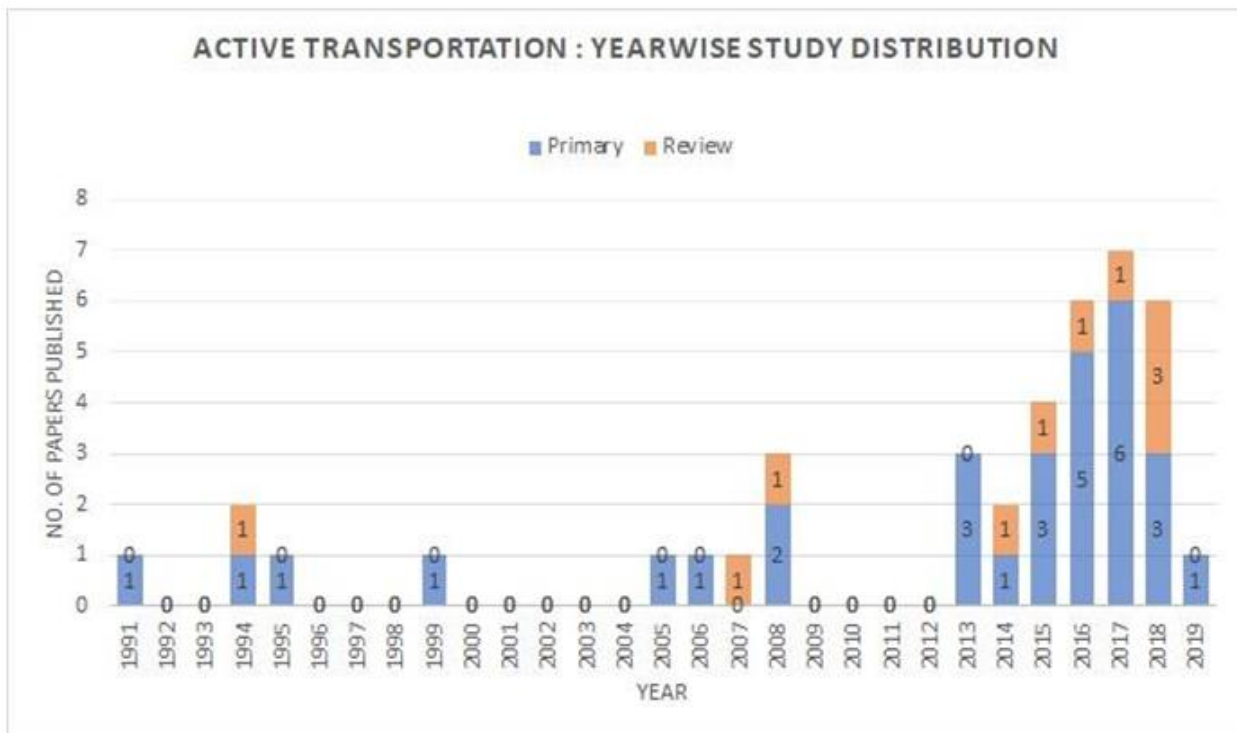


Fig 20

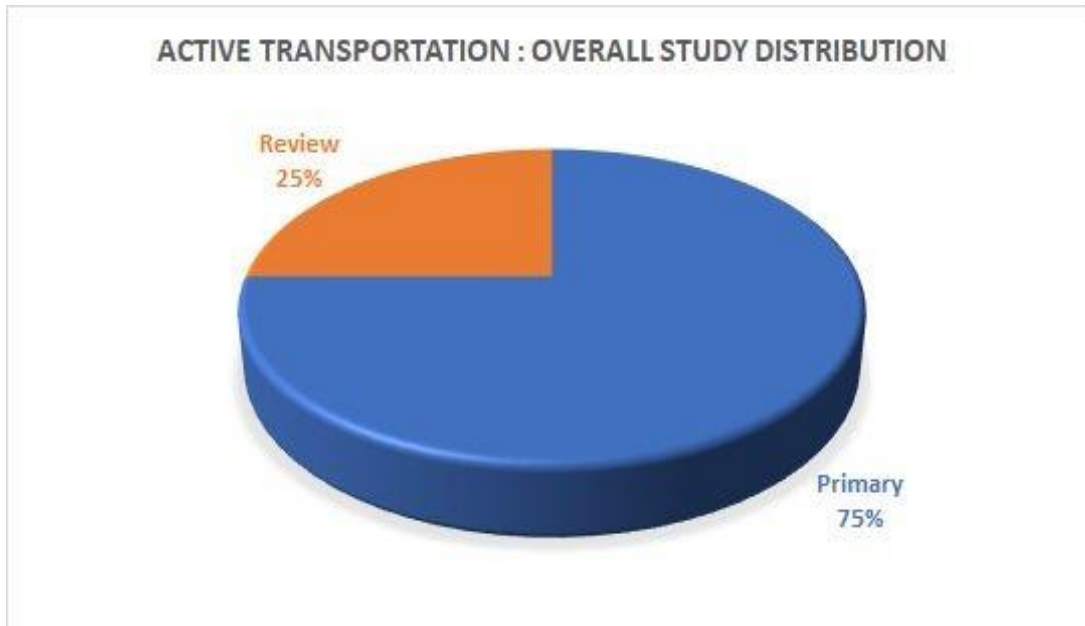


Fig 21

VIII. ANALYSIS BASED ON INTERVENTION PROPOSED

Based on whether the recommendations were general or specific to the case study the following pie charts were prepared .It is clearly evident that 97% of pollution papers had general solutions and 92% of RTI Papers gave general solutions and only a small portion of papers prescribed specific measures.As far as Active Transport Papers are considered around 77% of Papers provided with general solutions while 23% gave specific recommendations.

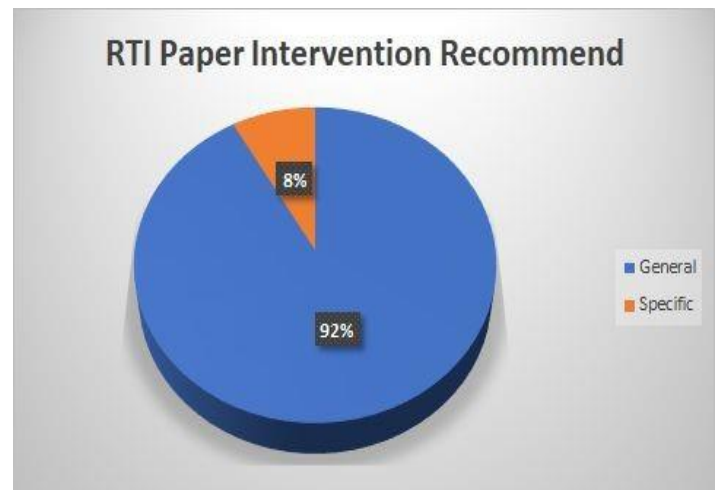


Fig 23



Fig 22

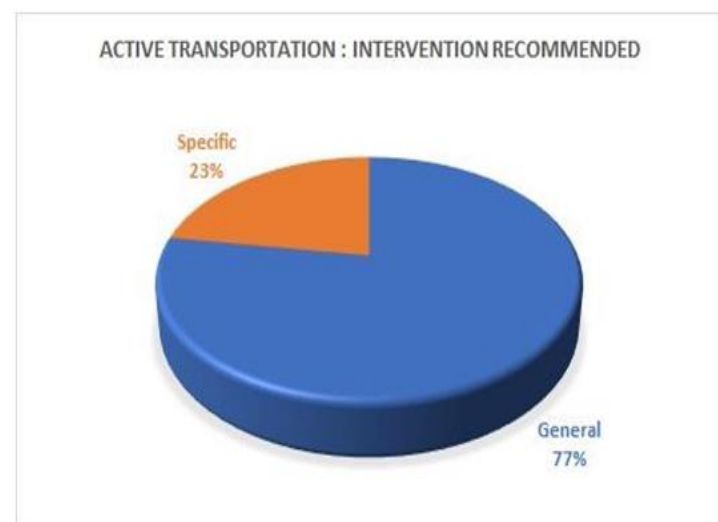


Fig 24

IX. STUDY AND TYPE CROSS-TAB ANALYSIS

Under this section we have tried to show relation between the type of study(Primary or Secondary) and Type of Paper(Type -1,2 or 3) published under different categories.

A. Pollution Papers:

As we can see in the pie charts below, for Primary Study we have only 16% papers under the Type2 category while 84% Papers under the Type 3 category. While for Reviewed Study Papers we have 80% as Type2 and only 20% as Type 3 .

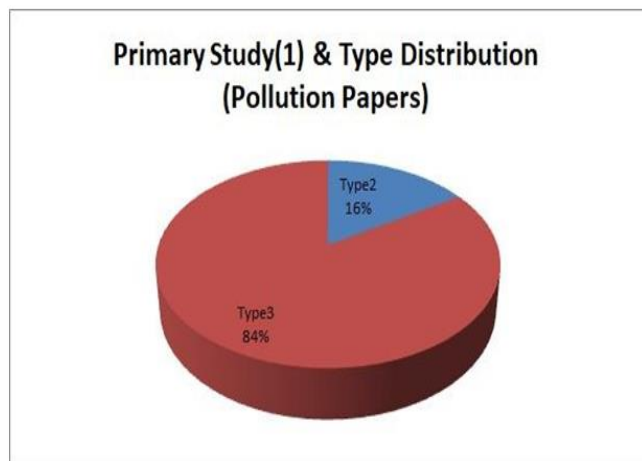


Fig 25

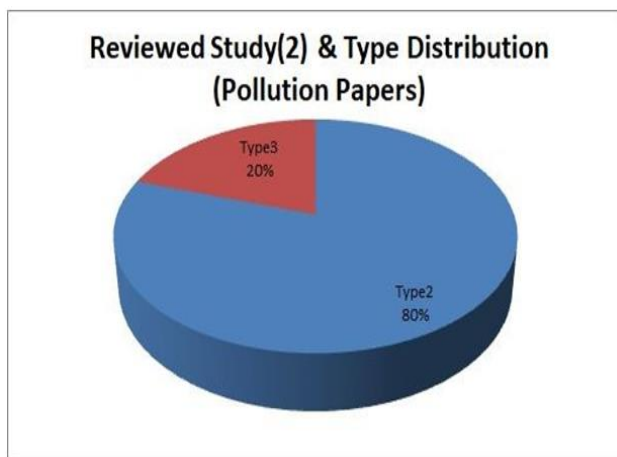


Fig 26

B. RTI Papers:

We can see clearly that for Primary study papers we have 45% as Type 1 ,42% as Type 2 and only 13% as Type 3. While in case of Reviewed studies the share of Type3 Paper is 0 while Type 1 papers have a share of 18% and Type 2 have a share of 82%.

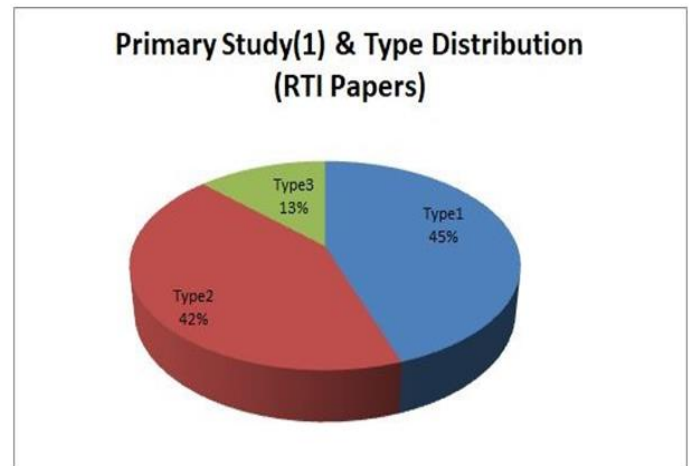


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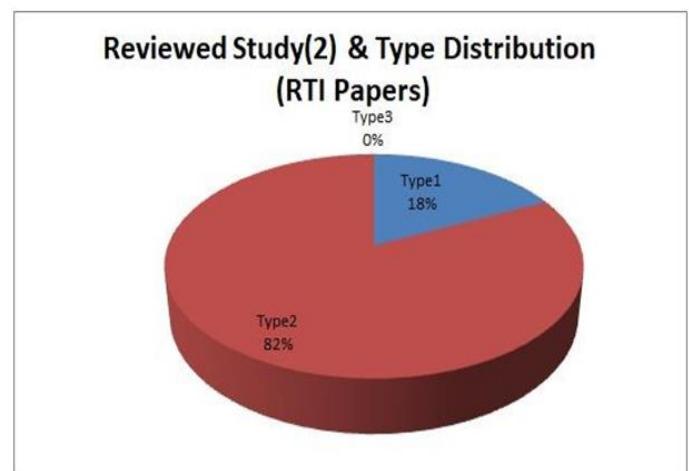


Fig 28

C. Active Transport Papers:

From the pie charts we can observe that 73% of Papers are Type 3 while 27% are Type2 for Primary studies. While for the case of Reviewed studies 90% of the papers were Type 2 while 10% of the papers are Type 3 with Type 1 being 0 in both the cases.

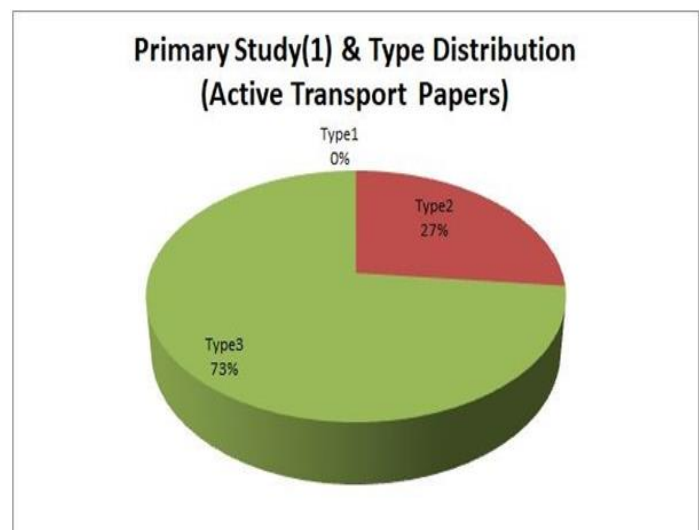


Fig 29

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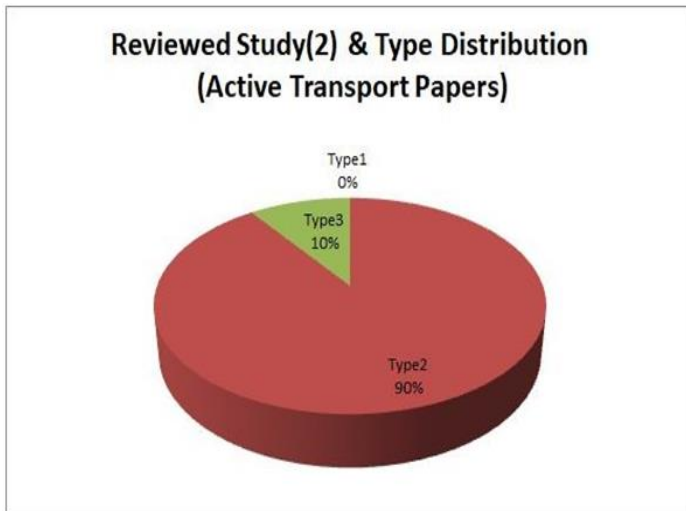


Fig 30

X. CONCLUSION

In this paper, We tried to figure out the areas of African transportation safety which need immediate assistance and aid to the ongoing research by analyzing 196 research paper available online. We mainly focused on the ill effects of road traffic injuries, active transportation and air pollution on people's health.

Our study showed that in the past decade, in recent years the number of research papers published on african road safety has increased. However this research is limited to certain African countries like South Africa, Kenya, Nigeria, Ghana etc. only. Out of 3 selected areas, the least number of papers are published in air pollution which shows there is lack of infrastructure or funds for the research in this area. Most of the research is done by local institutions in these countries, hence there is a scope of providing foreign assistance to encourage more research.

Majority of the research being carried out is of Type 3 i.e. source of collection of data was primary, except for Road traffic injury where type 2 dominates and researchers have relied on the data collected by government agencies which however in some cases can be less accurate as the data can be underreported or outdated. Type 1 Research i.e. Hospital-based studies share significant portion in RTI only and are negligible in air pollution and active transportation areas which needs to be improved.

Moreover, maximum research studies are primary but the solutions provided to the issues dealt in research, are more of general in nature rather than a specific plan to address the problem, which must be worked on by governments to encourage researchers and professionals to find a proper solution to the problem discussed in the paper.

In short, the paper gives many valuable insights and trends about ongoing research on transport safety in Africa which can be used for further studies.