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## Perinatal Death Analysis Report

The report of perinatal death in Nakuru County from 2014 to 2017 dataset. Perinata Death review forms are filled in the facility where the event occured and uploaded to DHIS2. Of more than 2000 events are available from the system. The dataset were downloaded and data cleaning done to remove data elements that does not fit definition of perinatal death, multiple entries and duplicates were deleted as well as empty columns.

## Distribution of Cases per Year and Organization unit.

Frequency of number of perinatal death per year.

perdatn %>%   
 with(table(Org\_unit, Year)) %>%  
 prop.table(margin=2)\*100

## Year  
## Org\_unit 2014 2015 2016 2017  
## Annex Hospital (Nakuru) 0.0000000 6.0747664 8.5106383 17.1779141  
## Bahati District Hospital 0.2493766 0.9345794 0.7092199 4.2944785  
## Baraka Maternity Home 0.0000000 0.0000000 2.1276596 0.0000000  
## Elburgon SDH 0.0000000 0.4672897 0.7092199 0.0000000  
## Molo SCH 0.0000000 0.4672897 3.5460993 0.0000000  
## Naivasha CRH 0.0000000 0.0000000 2.1276596 0.0000000  
## Nakuru Nursing Home 0.0000000 0.0000000 1.4184397 0.0000000  
## Nakuru PGH 99.7506234 92.0560748 78.0141844 78.5276074  
## Njoro SCH 0.0000000 0.0000000 2.8368794 0.0000000

perdatn %>% ## reported no of perinatal deaths by year in 2015 we had 431 deaths  
 group\_by(Org\_unit) %>%   
 summarise (n=n()) %>%  
 mutate(rel.freq = paste0(round(100 \* n/sum(n), 0), "%")) %>%   
 arrange(desc(rel.freq))

## # A tibble: 9 x 3  
## Org\_unit n rel.freq  
## <chr> <int> <chr>  
## 1 Nakuru PGH 835 91%  
## 2 Annex Hospital (Nakuru) 53 6%  
## 3 Bahati District Hospital 11 1%  
## 4 Molo SCH 6 1%  
## 5 Baraka Maternity Home 3 0%  
## 6 Elburgon SDH 2 0%  
## 7 Naivasha CRH 3 0%  
## 8 Nakuru Nursing Home 2 0%  
## 9 Njoro SCH 4 0%

## Nulliparous women versus Multiparous women.

Babies delivered by Nulliparous women are at greater risk of perinatal risk than multiparous women.The dataset is recorded on number of gravida mother ever had from 22 weeks gestation including the current pregnancy.

perdatn %>%   
 group\_by(Mgravrec) %>%   
 summarise (n=n()) %>%  
 mutate(rel.freq = paste0(round(100 \* n/sum(n), 0), "%")) %>%   
 arrange(desc(rel.freq))

## # A tibble: 3 x 3  
## Mgravrec n rel.freq  
## <chr> <int> <chr>  
## 1 Multiparous 553 60%  
## 2 Nulliparous 361 39%  
## 3 <NA> 5 1%

## Gestational Weeks

Using WHO classification of preterm, gestational weeks were classified on extremely preterm (Less than 28 weeks), very preterm(28-32 weeks) moderate to late preterm(32-37weeks) and post mature from 41 weeks and above. From the dataset 794 variables were complete with mean gestational of 34.5+/- 5.43, Min of 18 weeks and max of 48 weeks with skew of -0.59 and kurtosis of -0.45.

perdatn %>%   
 group\_by(rmgest) %>%   
 summarise (n=n()) %>%  
 mutate(rel.freq = paste0(round(100 \* n/sum(n), 0), "%")) %>%   
 arrange(desc(rel.freq))

## # A tibble: 6 x 3  
## rmgest n rel.freq  
## <chr> <int> <chr>  
## 1 post term 64 7%  
## 2 Full term 263 29%  
## 3 Late preterm 180 20%  
## 4 Ext preterm 142 15%  
## 5 Very preterm 137 15%  
## 6 <NA> 133 14%

## Type of pregnancy

A total of 765 (82%) of the cases were singleton, less than 15% being twin or triplet.

perdatn %>%   
 group\_by(preg\_type) %>%   
 summarise(n=n()) %>%   
 mutate(rel.freq = paste0(round(100 \* n/sum(n), 0), "%")) %>%   
 arrange(desc(rel.freq))

## # A tibble: 5 x 3  
## preg\_type n rel.freq  
## <chr> <int> <chr>  
## 1 Single 757 82%  
## 2 Triplet 29 3%  
## 3 Twin 122 13%  
## 4 Others 10 1%  
## 5 <NA> 1 0%

## Presentation of foetus

Cephalic account for 77% of the perinatal death

perdatn %>%   
 group\_by(foetus\_pres) %>%   
 summarise (n=n()) %>%  
 mutate(rel.freq = paste0(round(100 \* n/sum(n), 0), "%")) %>%   
 arrange(desc(rel.freq))

## # A tibble: 8 x 3  
## foetus\_pres n rel.freq  
## <chr> <int> <chr>  
## 1 Cephalic 708 77%  
## 2 Others 52 6%  
## 3 Transverse 24 3%  
## 4 Breech 123 13%  
## 5 <NA> 6 1%  
## 6 BBA 2 0%  
## 7 C/S 3 0%  
## 8 Face to pubis 1 0%

## Time of Newborn death

Of the deaths, 60% (557/929) died with 7 days of live.

perdatn %>%   
 group\_by(t\_nb\_death) %>%   
 summarise (n=n()) %>%  
 mutate(rel.freq = paste0(round(100 \* n/sum(n), 0), "%")) %>%   
 arrange(desc(rel.freq))

## # A tibble: 2 x 3  
## t\_nb\_death n rel.freq  
## <chr> <int> <chr>  
## 1 Within 7 days 548 60%  
## 2 Before delivery (Still birth) 371 40%

# Antenatal Care

## Did mother receive Antenatal care

perdatn %>%   
 group\_by(anr\_attend) %>%   
 summarise (n=n()) %>%  
 mutate(rel.freq = paste0(round(100 \* n/sum(n), 0), "%")) %>%   
 arrange(desc(rel.freq))

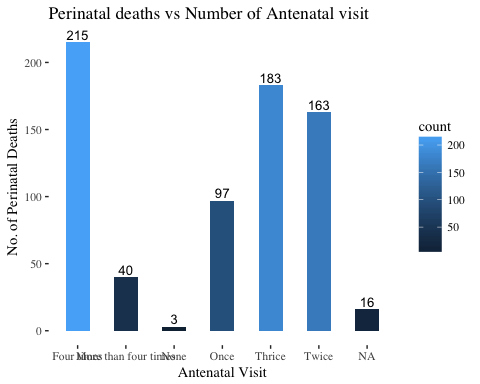
## # A tibble: 3 x 3  
## anr\_attend n rel.freq  
## <chr> <int> <chr>  
## 1 Yes 717 78%  
## 2 No 199 22%  
## 3 <NA> 3 0%

## How many antenatal visits done

perdatn %>%   
 group\_by(anc\_visits) %>%   
 summarise (n=n()) %>%  
 mutate(rel.freq = paste0(round(100 \* n/sum(n), 0), "%")) %>%   
 arrange(desc(rel.freq))

## # A tibble: 7 x 3  
## anc\_visits n rel.freq  
## <chr> <int> <chr>  
## 1 More than four times 40 4%  
## 2 Four times 217 24%  
## 3 None 198 22%  
## 4 Thrice 183 20%  
## 5 <NA> 21 2%  
## 6 Twice 163 18%  
## 7 Once 97 11%

perdatn %>%   
 filter(anr\_attend == "Yes") %>%  
 group\_by(anc\_visits) %>%   
 summarise(count = n()) %>%   
 arrange(desc(count)) %>%   
 ggplot + aes( x = anc\_visits, y = count,fill = count ) +   
 geom\_bar(stat = "identity",position = position\_dodge(0.2), width = 0.5) +  
 geom\_text(aes(label = count), vjust = -0.3, size = 3.5) +  
 labs(title="Perinatal deaths vs Number of Antenatal visit") +  
 labs(x="Antenatal Visit", y="No. of Perinatal Deaths") +  
 theme\_tufte()



## 

What type of intervention mother received in health facility. Of interest in Tetanus toxoid and iron supplement

perdatn %>%   
 filter( anr\_attend == "Yes") %>%  
 group\_by(r\_tt) %>%   
 summarise (n=n()) %>%  
 mutate(rel.freq = paste0(round(100 \* n/sum(n), 0), "%")) %>%   
 arrange(desc(rel.freq))

## # A tibble: 3 x 3  
## r\_tt n rel.freq  
## <chr> <int> <chr>  
## 1 Yes 529 74%  
## 2 No 187 26%  
## 3 <NA> 1 0%

perdatn %>%  
 filter( anr\_attend == "Yes") %>%   
 with(table(Year,r\_fesup)) %>%  
 prop.table(margin=2)\*100

## r\_fesup  
## Year No Yes  
## 2014 46.85864 36.03604  
## 2015 23.82199 24.92492  
## 2016 14.13613 15.91592  
## 2017 15.18325 23.12312

## Danger signs

Were danger signs identified during the antenatal visit and if so what action were taken.

perdatn %>%  
 filter( anr\_attend == "Yes") %>%  
 group\_by(iden\_dang\_sign) %>%   
 summarise (n=n()) %>%  
 mutate(rel.freq = paste0(round(100 \* n/sum(n), 0), "%")) %>%   
 arrange(desc(rel.freq))

## # A tibble: 2 x 3  
## iden\_dang\_sign n rel.freq  
## <chr> <int> <chr>  
## 1 No 529 74%  
## 2 Yes 188 26%

perdatn %>%  
 filter( anr\_attend == "Yes") %>%   
 filter( iden\_dang\_sign == "Yes") %>%  
 group\_by(referral) %>%   
 summarise (n=n()) %>%  
 mutate(rel.freq = paste0(round(100 \* n/sum(n), 0), "%")) %>%   
 arrange(desc(rel.freq))

## # A tibble: 2 x 3  
## referral n rel.freq  
## <chr> <int> <chr>  
## 1 Yes 103 55%  
## 2 No 85 45%

perdatn %>%  
 filter( anr\_attend == "Yes") %>%   
 filter( iden\_dang\_sign == "Yes") %>%  
 group\_by(anti\_hyp) %>%   
 summarise (n=n()) %>%  
 mutate(rel.freq = paste0(round(100 \* n/sum(n), 0), "%")) %>%   
 arrange(desc(rel.freq))

## # A tibble: 2 x 3  
## anti\_hyp n rel.freq  
## <chr> <int> <chr>  
## 1 No 164 87%  
## 2 Yes 24 13%

perdatn %>%   
 filter( anr\_attend == "Yes") %>%   
 filter( iden\_dang\_sign == "Yes") %>%  
 group\_by(anti\_bio) %>%   
 summarise (n=n()) %>%  
 mutate(rel.freq = paste0(round(100 \* n/sum(n), 0), "%")) %>%   
 arrange(desc(rel.freq))

## # A tibble: 2 x 3  
## anti\_bio n rel.freq  
## <chr> <int> <chr>  
## 1 No 184 98%  
## 2 Yes 4 2%

## Use of partograph

Partograph is important tool for identification and appropriate management of women at high risk of maternal complication to avert maternal and perinatal deaths. More than half (52%) [459/884] of the cases were monitor with partograph.

perdatn %>%   
 filter (!(loc\_del=="Home")) %>%   
 filter (!(loc\_del=="BBA")) %>%   
 group\_by(part\_use) %>%   
 summarise (n=n()) %>%  
 mutate(rel.freq = paste0(round(100 \* n/sum(n), 0), "%")) %>%   
 arrange(desc(rel.freq))

## # A tibble: 3 x 3  
## part\_use n rel.freq  
## <chr> <int> <chr>  
## 1 Yes 451 51%  
## 2 No 425 48%  
## 3 <NA> 2 0%

## Mode of delivery

On Skill delivery 60% were Skilled Birth attendant delivery and 31% through caesarian section.

perdatn %>%   
 group\_by(mod) %>%   
 summarise (n=n()) %>%  
 mutate(rel.freq = paste0(round(100\*n/sum(n),0),"%")) %>%   
 arrange(desc(rel.freq))

## # A tibble: 7 x 3  
## mod n rel.freq  
## <chr> <int> <chr>  
## 1 SVD (unskilled birth attendant) 62 7%  
## 2 SVD (skilled birth attendant) 538 59%  
## 3 Caesarian Section 290 32%  
## 4 Breech 24 3%  
## 5 Assisted vaginal delivery 2 0%  
## 6 BBA 2 0%  
## 7 Destructive operation 1 0%

## Those at risk

For those at risk what delivery mod was conducted of interest are there some who delivered at home or born before arrival

perdatn %>%   
 filter( iden\_dang\_sign == "Yes") %>%  
 group\_by(mod) %>%   
 summarise (n=n()) %>%  
 mutate(rel.freq = paste0(round(100\*n/sum(n),0),"%")) %>%   
 arrange(desc(rel.freq))

## # A tibble: 5 x 3  
## mod n rel.freq  
## <chr> <int> <chr>  
## 1 SVD (skilled birth attendant) 106 51%  
## 2 Breech 11 5%  
## 3 Caesarian Section 83 40%  
## 4 SVD (unskilled birth attendant) 5 2%  
## 5 Assisted vaginal delivery 1 0%

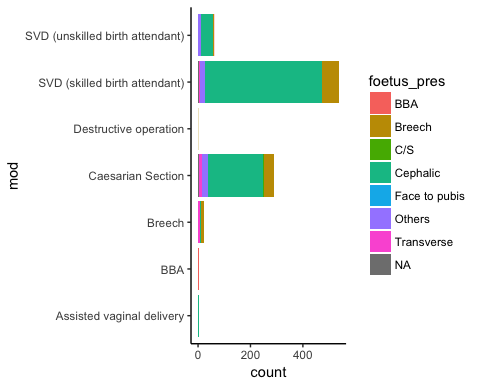
## Who conducted delivery.

Where any delivery conducted by Unskilled Birth Attendant

perdatn %>%  
 group\_by(who\_del) %>%   
 summarise(n=n()) %>%   
 mutate(rel.freq = paste0(round(100\*n/sum(n),0),"%"))

## # A tibble: 8 x 3  
## who\_del n rel.freq  
## <chr> <int> <chr>  
## 1 Clinical Officer 5 1%  
## 2 Community midwife 6 1%  
## 3 Doctor 328 36%  
## 4 No One 7 1%  
## 5 Nurse/Midwife 529 58%  
## 6 Relative (not health prof) 25 3%  
## 7 TBA 3 0%  
## 8 Unknown 16 2%

ggplot(perdatn, aes(x = mod, fill = foetus\_pres),alpha=0.8) +  
 geom\_bar() +  
 coord\_flip() +  
 theme\_classic()



twoby2( perdatn$lab\_loc\_st, perdatn$c\_baby\_birth)

## 2 by 2 table analysis:   
## ------------------------------------------------------   
## Outcome : Alive   
## Comparing : Home vs. Tier2   
##   
## Alive Fresh still birth P(Alive) 95% conf. interval  
## Home 329 113 0.7443 0.7016 0.7829  
## Tier2 39 36 0.5200 0.4078 0.6302  
##   
## 95% conf. interval  
## Relative Risk: 1.4314 1.1439 1.7912  
## Sample Odds Ratio: 2.6875 1.6286 4.4349  
## Conditional MLE Odds Ratio: 2.6819 1.5732 4.5667  
## Probability difference: 0.2243 0.1070 0.3421  
##   
## Exact P-value: 2e-04   
## Asymptotic P-value: 1e-04   
## ------------------------------------------------------