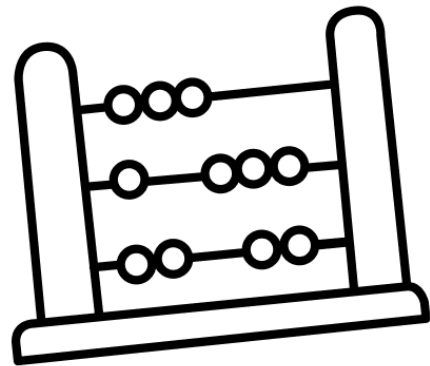


Shaqaale ka jawaab celiya degdegga (Emergency response worker)



Maths

Unit Xisaabta goobta shaqada

Natiijo

Waxaan fahmi karaa sida xisaabta loogu isticmaalo shaqaalaha ka jawaab celiya degdegga.

Erayada muhiimka ah

Qaacidada (Formula) waa xeer isku xira doorsoomayaal jireed (physical variables) macnaha guud.

Xogta (Data) waa ururinta macluumaadka.

Qaabka casharka

Shaqaale ka jawaab celiya degdegga (Emergency response worker)



Isticmaalka qaacidada (Formulas)



Isticmaalka xogta (Data)

Qaacidada (Formulas) waxay ku yaalliin meel kasta oo adduunkeenna ah.

Waxaan ku aragnaa sayniska
(Aragtida Einstein ee relative-ka)

Waxaan u isticmaalnaa karinta
(Waqtiga karinta digaagga)

$$(i\partial - m)\psi = 0$$

Dadka qaar waxay rumeysan yihiin inaad xitaa qori karto qaacido
(Formula) jacaylka

Isticmaalka qaacidada (Formulas)

Shaqaalaha ka jawaab celiya degdegga waxay isticmaalaan qaacidada (Formulas) maalin kasta.



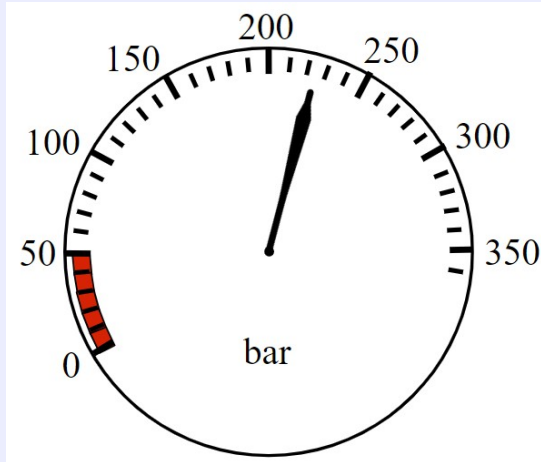
Kani waa cabbirka (gauge) qalabka neefsiga dab-demiyaha.

Marka dab-demiyuhu ku xiro taangiga oksijiinka, gauge-gu wuxuu u sheegaa inta bar ee cadaadiska ah ee hadhay.

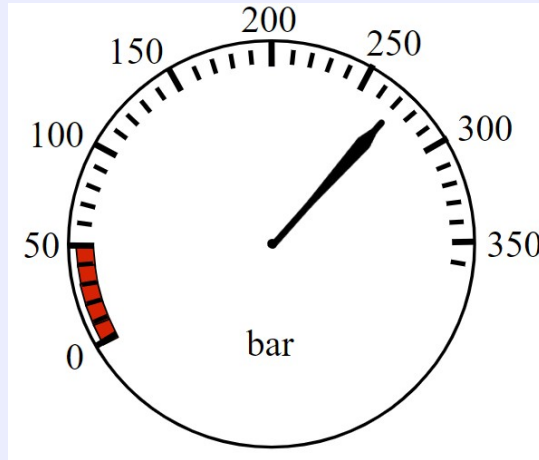
Ingiriiska, dab-demiyuhu waa inuu leeyahay ugu yaraan 240 bar oo cadaadis ah taangigiisa oksijiinka ka hor inta uusan gudaha guri ka gelin.

Uses of formulas

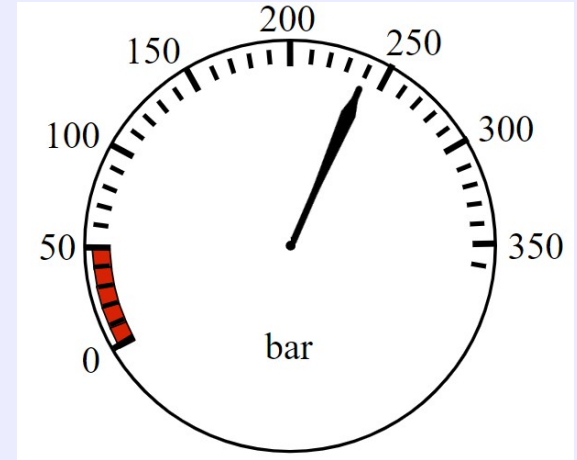
Ingiriiska, dab-demiyuhu waa inuu leeyahay ugu yaraan 240 bar oo cadaadis ah si uu gudaha guri ugu galo. Kee ka mid ah taangiyadan si ammaan ah ayaa loo isticmaali karaa?



a ✗



b ✓



c ✓

Dab-demiyayaashu waxay gudaha guri u gali karaan si ay u damiyaan dabka. Waxay gali karaan guri weyn oo dad badan ku jira si ay u sameeyaan raadinta iyo samatabbixinta inta dabku socdo. Ka hor inta ayan gelin, mid kastaa wuxuu isticmaalaa qaacidada muhiimka ah.

$$t = \frac{1}{2}b + 30$$

t waxay u taagan tahay cadaadiska wareegidda ee la qiyaasay.

b waa tirada bar ee cadaadiska ay la galaan.

Qaacidada waxay xisaabisaa marka dab-demiyuhu uu wareego oo ka baxo guriga gubanaya.

Tusaale, dab-demiyuhu wuxuu la galay 240 bar oo cadaadis ah...

...wuxuu wareegi doonaa marka gauge-kiisu uu akhriyo 150 bar

$$150 = \frac{1}{2}(240 - 30)$$

t waxay u taagan tahay cadaadiska wareegidda ee la qiyaasay.

b waa tirada bar ee cadaadiska ay la galaan.

Qaacidada waxay xisaabisaa marka dab-demiyuhu uu wareego oo ka baxo guriga gubanaya.

Tusaale, dab-demiyuhu wuxuu la galay 240 bar oo cadaadis ah...

...wuxuu wareegi doonaa marka gauge-kiisu uu akhriyo 150 bar

$$150 = \frac{1}{2}(240) + 30$$

150 bar waxay u ekaan kartaa inay tahay cadaadis badan oo hadhay, laakiin dab-demiyuhu wuxuu ku jiri karaa gudaha guriga qoto dheer oo wuxuu isticmaali karaa hawo badan isagoo baxaya. Waxa xitaa laga yaabaa inuu qaado qof!

Dab-demiyuhu markuu la galo 290 bar, wuxuu wareegi doonaa immisa bar?

$$t = \frac{1}{2}b + 30$$

$$t = \frac{1}{2}(290) + 30$$

$$175 = \frac{1}{2}(290) + 30$$

Waxay jees jeesi doonaan oo bilaabi doonaan inay ka baxaan marka cabirkoodu akhriyo 175 bar

Isticmaalka qaaciidooyinka (formulas)



Cabdi wuxuu xisaabinayaa meesha qiyaasta ah ee dab-demiyaha uu ka soo laabto isagoo gala dhismo leh 260 bar

$$t = \frac{1}{2}b + 30$$

$$260 + 30 = 290$$

Nuskaas waa 145 marka waxay ka soo laaban doonaan 145 daqiiqo kadib.

Cabdi wuxuu sameeyay ugu yaraan hal qalad. Soo hel qaladkiisa oo sharax sida uu u saxayo.



Cabdi wuxuu xisaabinayaa meesha qiyaasta ah ee dab-demiyaha uu ka soo laabto isagoo gala dhismo leh 260 bar

$$t = \frac{1}{2}b + 30$$

$$260 + 30 = 290$$

Nuskaas waa 145 marka waxay ka soo laaban doonaan 145 daqiiqo kadib.

Waxaa laga yaabaa inaad tidhaahdo, "Cabdi wuu ku guuldareystay inuu raaco mudnaanta hawlgallada (priority of operations). 260 bar waa in lagu dhuffey nus ka hor inta aan +30 lagu darin".



Cabdi wuxuu xisaabinayaa meesha qiyaasta ah ee dab-demiyaha uu ka soo laabto isagoo gala dhismo leh 260 bar

$$t = \frac{1}{2}b + 30$$

$$260 + 30 = 290$$

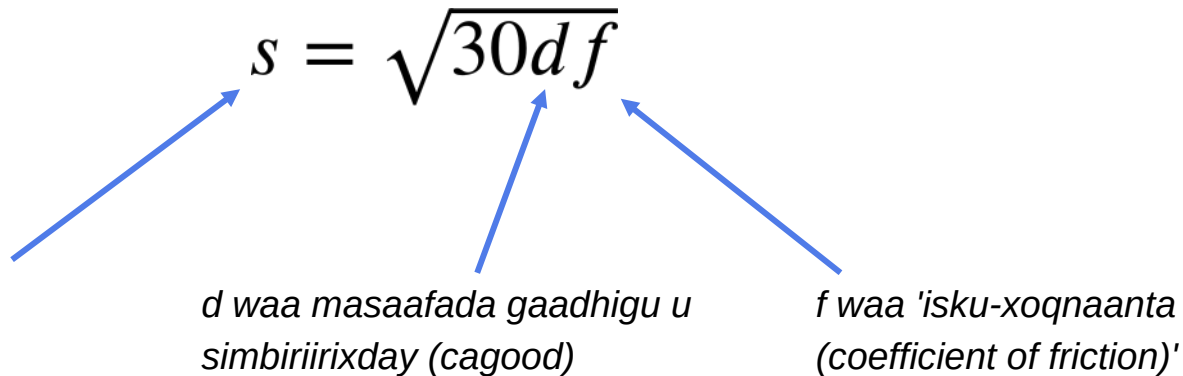
Nuskaas waa 145 marka waxay ka soo laaban doonaan 145 daqiiqo kadib.

Waxaa laga yaabaa inaad tidhaahdo, "Cabdi wuxuu isticmaalay halbeegyo (units) khaldan jawaabtiisa. Meesha la soo laabto waxay ku jirtaa halbeegyada cadaadiska (bar) ee hadhaaga. Ma aha waqti lagu qaatay gudaha dhismaha".



Dab-deminta ma aha shaqada kaliya ee jawaabta degdegga ah ee isticmaasha qaaciidooyinka.

Baarayaasha shilalka ee ciidanka booliiska waxay isticmaali karaan qaaciido goobta shilka si ay u xisaabiyaan xawaaraha uu gaadhigu ku socday.

$$s = \sqrt{30df}$$


d waa masaafada gaadhigu u simbiririxday (cagood)

f waa 'isku-xoqnaanta (coefficient of friction)'

Isticmaalka qaaciidooyinka (formulas)

f, 'isku-xoqnaanta (coefficient of friction)', waa isku-xoqnaanta u dhaxaysa taayirada iyo wadada. Tiradan way kala duwan tahay kaalaha iyo nooca dusha sare.

f, 'isku-xoqnaanta (coefficient of friction)', waa isku-xoqnaanta u dhaxaysa taayirada iyo wadada. Tiradan way kala duwan tahay xaaladda iyo nooca dusha sare.

Tusaale ahaan, dusha shubka ee qalalan isku-xoqnaantu waa 0.8 halka dusha shubka ee qoyan isku-xoqnaantu tahay 0.4

$$s = \sqrt{30df}$$

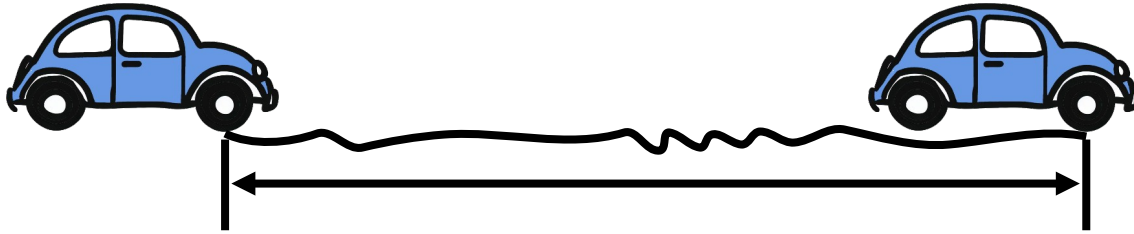
s waa xawaaraha uu gaarigu ku socday (mph)

d waa masaafada uu gaarigu ku simbiririxay (feet)

f waa 'coefficient of friction'

Isticmaalka formulas

Sarkaal booliis ayaa cabbiray calaamadahan simbiririxooda goobta shilka waddo la taashay maalin qalalan.



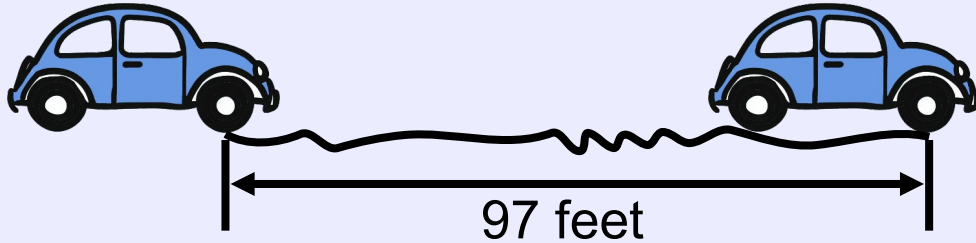
Marka la geliyo formula waxay xisaabin karaan sida uu gaarigu u dhakhsaday.

$$s = \sqrt{30df}$$

$$s = \sqrt{30(120)(0.8)}$$



Sarkaal booliis ayaa cabbiray calaamadahan simbiririxooda goobta shilka waddo la taashay maalin qoyan.



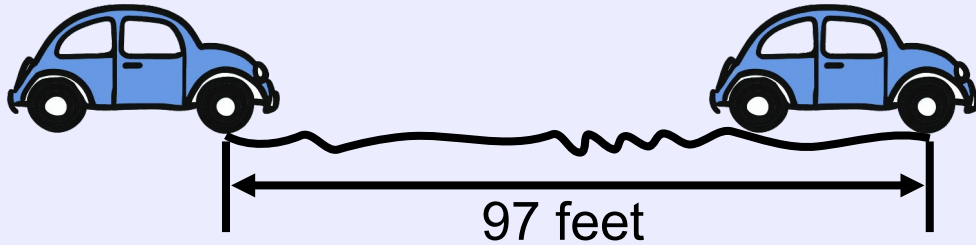
Ma gaarigu wuu ka badnaa xadka xawaaraha 30 mph?

$$s = \sqrt{30df}$$

Coefficient of friction ee dusha qoyan waa 0.4

Isticmaalka formulas

Sarkaal booliis ayaa cabbiray calaamadahan simbiririxooda goobta shilka waddo la taashay maalin qoyan.



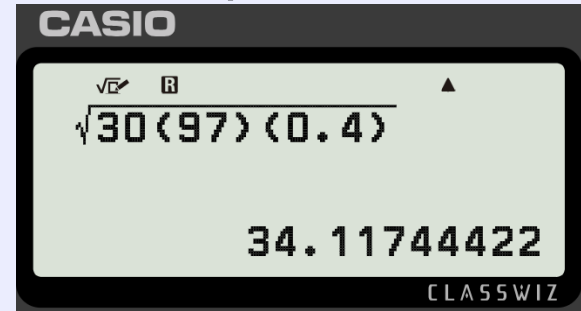
Ma gaarigu wuu ka badnaa xadka xawaaraha 30 mph?

$$s = \sqrt{30df} \quad s = \sqrt{30(97)(0.4)}$$

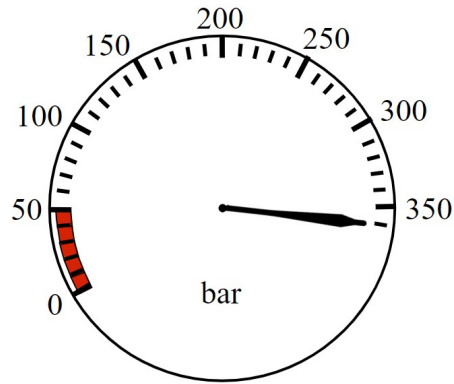
$$d = 97 \quad s = 34.1 \text{ mph (ilaa 1 d.p.)}$$

$$f = 0.4$$

Haa, gaarigu wuu ka badnaa xadka 30 mph.



1) a) Dab-demiyaha ayaa gala dhismaha iyadoo akhrinta gauge-kiisu ay tahay sidan. Bar intee le'eg ayay tahay inay ku jeestaan oo ay bilaabaan bixista?



$$t = \frac{1}{2}b + 30$$

b) Dab-demiyaha ayaa leh qiyaas cadaadis jeesasho ah 160 bar. Intee bar oo cadaadis ah ayay lahaayeen markii ay soo galeen?

1) c) Waa maxay farqiga u dhexeeya cadaadiska leexashada marka la galo 240 bar iyo marka la galo 300 bar?

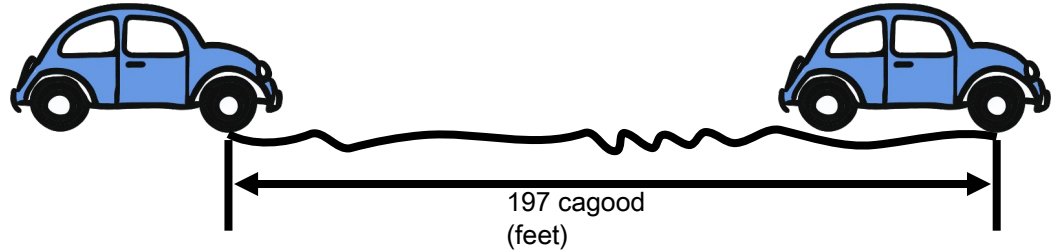
$$t = \frac{1}{2}b + 30$$

d) Maxaad u malaynaysaa in qaaciidada ay ku jirto + 30 halkii ay ka ahaan lahayd

$$\text{lahayd } t = \frac{1}{2}b$$

2) a) Waxaad tahay sarkaal booliis oo baaraya shil. Isticmaal qaaciidada si aad u xisaabiso xawaaraha baabuurkan oo ku socda dusha shubka ah ee qalalan ($f = 0.8$)

$$s = \sqrt{30df}$$



b) Haddii baabuur uu soconayo 70 mph oo ku socdo dusha shubka ah ee qoyan ($f = 0.4$), intee in le'eg ayaad filanaysaa in uu noqdo calaamadda skid-ka (skid mark)?

2) c) Cabdi wuxu si khaldan u isticmaalay qaaciidada si uu u xisaabiyo xawaaraha baabuur leh calaamad skid ah oo 60 cagood (feet) ah oo ku socda dusha shubka ah ee qalalan ($f = 0.8$). Sharax qaladkiisa oo sax shaqadiisa.

$$s = \sqrt{30df}$$



Xisaabiyaha (Calculator) wuxuu ii sheegay in xawaarahoodu ahaa 262.9 mph

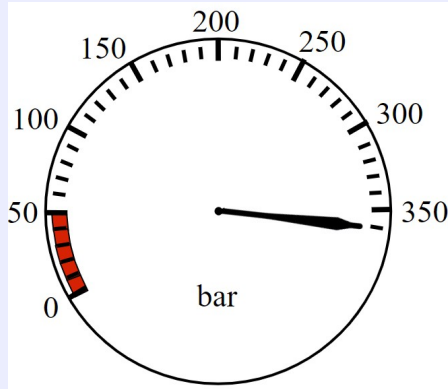


2) d) Sarkaal booliis oo baaraya shil ku dhacay aagga xawaarihiisu yahay 20 mph oo leh dusha shubka ah ee qalalan ($f = 0.8$) ayaa ku dhawaaqay, "Dhererka calaamadaha waxay ahaayeen 20 cagood (feet) marka loo soo dhawaajiyo 10 cagood (feet) ugu dhow".

Sharax sababta ay ugu kala soo dhawayn karin (round) sidan marka ay baarayaan shilkan.

$$s = \sqrt{30df}$$

1) a) Dab-demiyaha (Firefighter) wuxu galaa dhismaha iyadoo akhriska gauge-kiisu uu yahay sidaas. Immisa bar ayay tahay inay ku leexdaan oo ay bilaabaan ka bixista?



$$t = \frac{1}{2}b + 30$$

$$t = \frac{1}{2}(360) + 30 = 210$$

1) b) Dab-demiyaha (Firefighter) wuxu leeyahay qiyaas cadaadis leexasho ah 160 bar. Immisa bar oo cadaadis ah ayuu lahaa markii uu galay?

$$t = \frac{1}{2}b + 30$$

$$(160) = \frac{1}{2}b + 30$$

$$130 = \frac{1}{2}b$$

1) c) Waa maxay farqiga u dhexeeya cadaadiska leexashada marka la galo 240 bar iyo marka la galo 300 bar?

$$t = \frac{1}{2}b + 30$$

$$t = \frac{1}{2}(240) + 30 = 150$$

$$t = \frac{1}{2}(300) + 30 = 180$$

$$180 - 150 = 30$$

Farqiga u dhexeeya wareegga waa 30 bar oo cadaadis ah.

1) d) Maxaad u malaynaysaa in formula-ka uu ku daray +30 halkii uu ahaan lahaa ?

$$t = \frac{1}{2}b$$

Waxaa laga yaabaa inaad tidhi, "Haddii formula-ku ahaan lahaa, dab-demiyayaashu waxay jees jees lahaayeen ka dib markay isticmaalaan badh hawadooda.

Haddii ay ku dadaalaan wax ka badan bixitaanka (tusaale, haddii ay qadayaan qof), ma lahaan lahaayeen hawad ku filan si ay si ammaan ah uga baxaan.

In la yeesho +30 ee formula-ka waxay siinaysaa iyaga kayd yar oo ammaan ah".

2) a) Waxaad tahay sarkaal booliis ah oo baaraya shil. Isticmaal formula-ka si aad u xisaabiso xawaaraha gaarigan oo ku socda dusha shubka ah ee qallalan ($f = 0.8$)

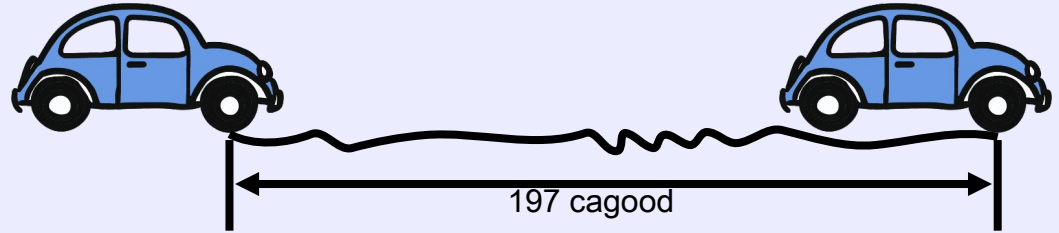
$$s = \sqrt{30df}$$

$$d = 197$$

$$f = 0.8$$

$$s = \sqrt{30(197)(0.8)}$$

$$s = 68.8 \text{ mph (ilaa 1 d.p.)}$$



2) b) Haddii gaari uu socdo 70 mph oo ku yaal dusha qoyan ee shubka ah ($f = 0.4$), intee in le'eg ayaad filanaysaa inuu noqdo calaamadda skid-ka?

$$s = \sqrt{30df}$$

$$(70) = \sqrt{30d(0.4)}$$

$$70 = \sqrt{12d}$$

$$4900 = 12d$$

$$d = 408.3 \text{ cagood (ilaa 1 d.p.)}$$

2) c) Lucas wuxuu si khaldan u isticmaalay formula-ka si uu u xisaabiyo xawaaraha gaari leh calaamad skid ah oo 60 cagood ah oo ku yaal dusha qallalan ($f = 0.8$). Sharax qaladkiisa oo sax shaqadiisa.

$$s = \sqrt{30df}$$



Xisaabiyaha wuxuu ii sheegayaa in xawaarahoodu ahaa 262.9 mph



Waxaa laga yaabaa inaad tidhi:
"Vinculum-ku waa inuu kooxeeyaa 30df"

2) d) Sarkaal booliis ah oo baaraya shil ku dhacay aagga 20 mph oo leh dusha qallalan ($f = 0.8$) wuxuu ku dhawaaqay, "Dhererka calaamaduhu wuxuu ahaa 20 cagood ilaa 10 cagood ee ugu dhow".

Sharax sababta aanay ugu wareegi karin sidan marka la baarayo shilkan.

Waxaa laga yaabaa inaad tidhi: "Marka lagu wareejiyo 10ka ugu dhow, dhererka dhabta ah wuxuu ku dhacaa xadka $15 \leq d < 25$, taas oo ka dhigaysa xadka xawaaraha..."

$$s = \sqrt{30df}$$

$$\sqrt{30(15)(0.8)} \leq s < \sqrt{30(25)(0.8)}$$

"Ma aan caddayn karno in darawalgan uu raacay xadka xawaaraha iyo in kale."

Shaqaalaha gargaarka degdegga ah



Isticmaalka qaaciidooyinka (Formulas)

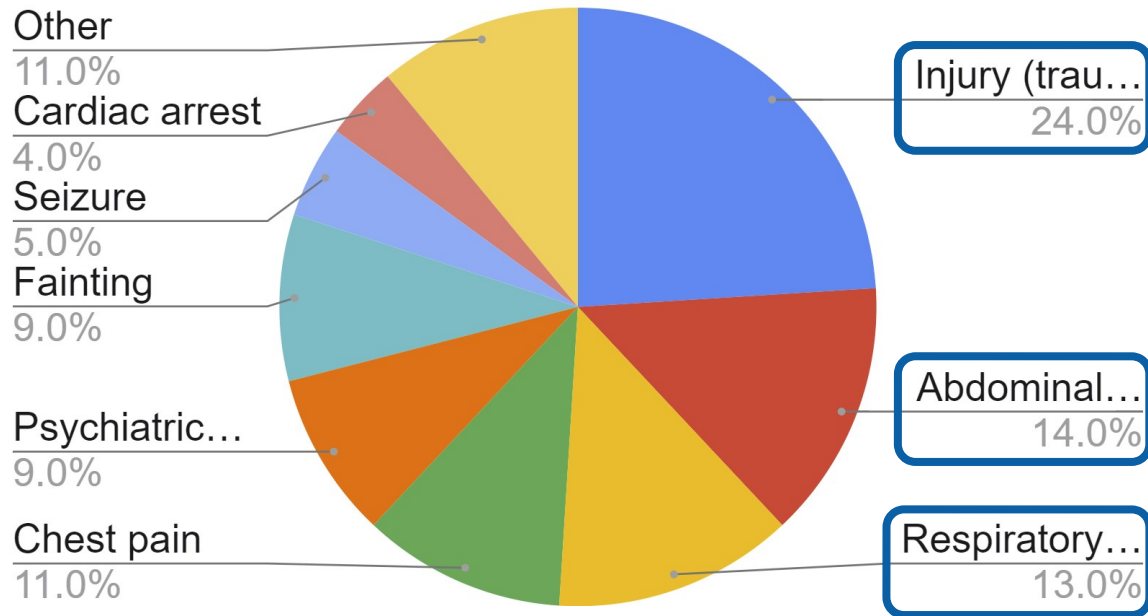


Isticmaalka xogta (Data)

Xogtu (Data) waa qayb muhiim ah oo ka mid ah guusha shaqada shaqaalaha adeegyada degdegga ah.

Xogtu (Data) waxay u oggolaanaysaa adeegyada degdegga ah inay si fiican u qorsheeyaan si ay u daboolaan baahida dadweynaha.

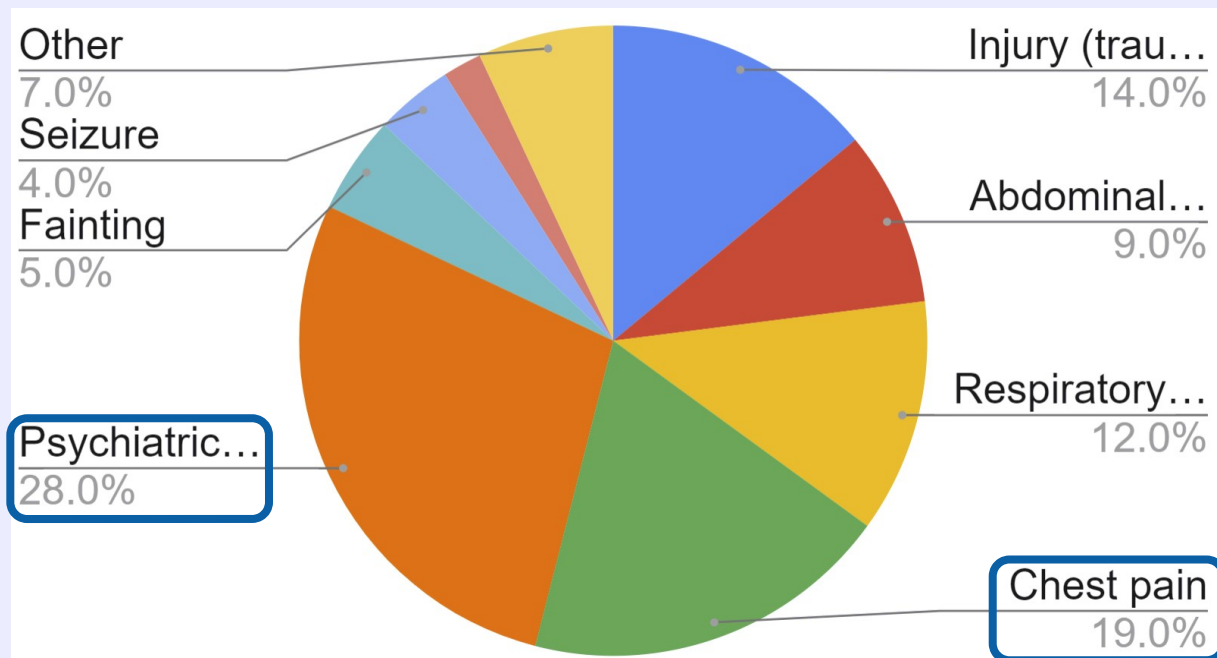
Saldhigga ambalaasta wuxuu diiwaan geliyaa xogta sababaha wicitaanada ee paramedics-kiisa muddo rubuc sano ah.



Xogtan waxay u sheegaysaa inay u baahan yihiin inay ku kaydiyaan ambalaastahooda qalab caafimaad oo badan si ay u daaweeyaan:

- Dhibaato neefsasho (Respiratory distress)

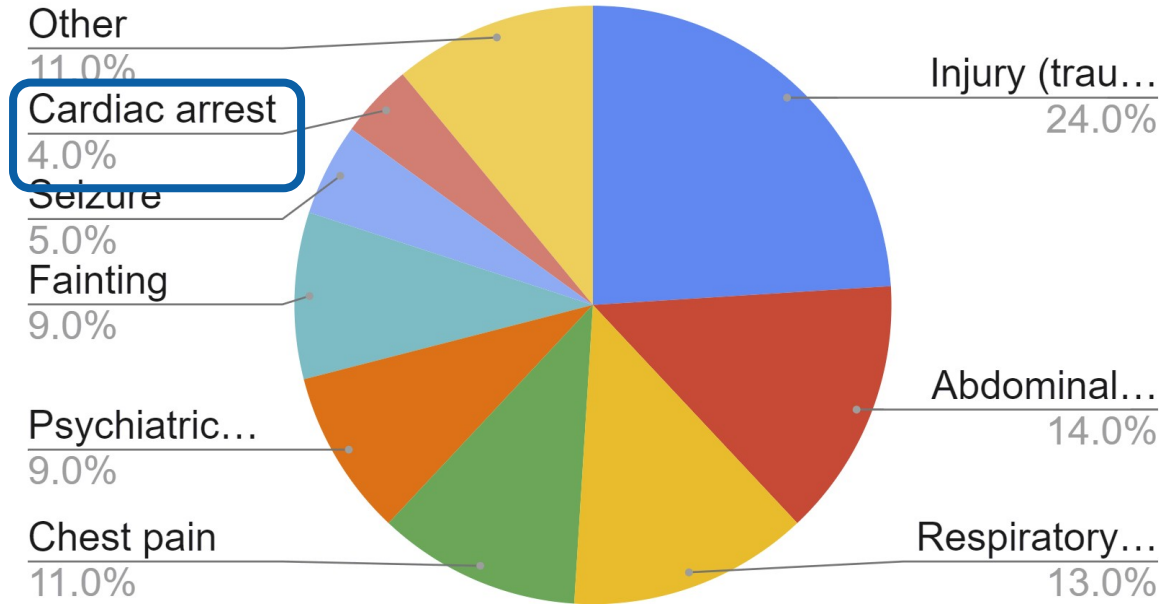
Saldhig ambalaas oo kala duwan oo ku yaal bartamaha magaalada ayaa diiwaan geliya xog.



Cudurka maskaxda (Psychiatric disorder) iyo xanuunka laabta.

Cudurkee ay tahay inay u huraan waqtiga tababarka ugu badan ee shaqaalahooda gargaarka degdegga ah?

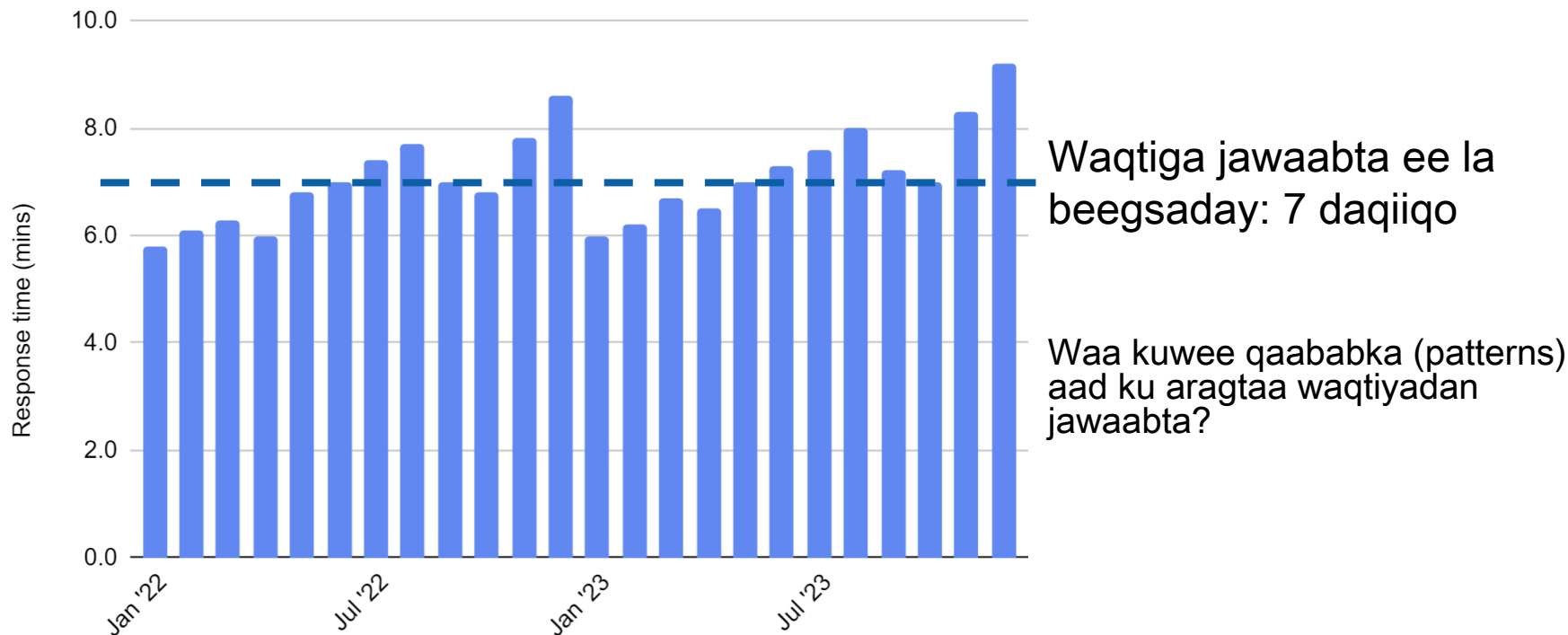
Haddii aad waligeed wacdo ambalaas, waxaad la xiriirtaa gargaare degdeg ah oo shaqadiisu tahay inuu qiimeeyo oo uu mudnaan siiyo baahidaada.



Cudurrada halis ku ah nolosha, adeegyada gargaarka degdegga ah waxay dejiyaan waqtiyada jawaabta (response times) ee la beegsaday.

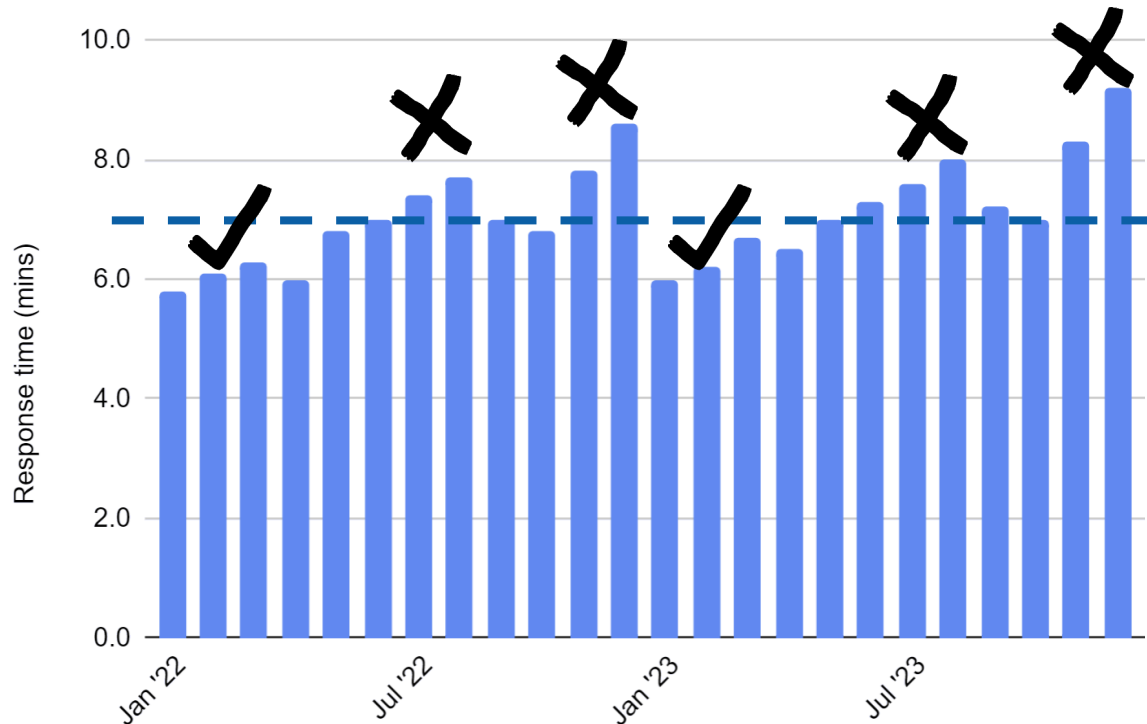
Isticmaalka xogta (data)

Saldhigga ambalaaska wuxuu diiwaan geliyaa celceliska waqtiga ay ku gaadhaan wicitaan kasta oo wadne-istaag (cardiac arrest) ah muddo laba sano ah.



Isticmaalka xogta (data)

Saldhigga ambalaaska wuxuu diiwaan geliyaa celceliska waqtiga ay ku gaadhaan wicitaan kasta oo wadne-istaag (cardiac arrest) ah muddo laba sano ah.

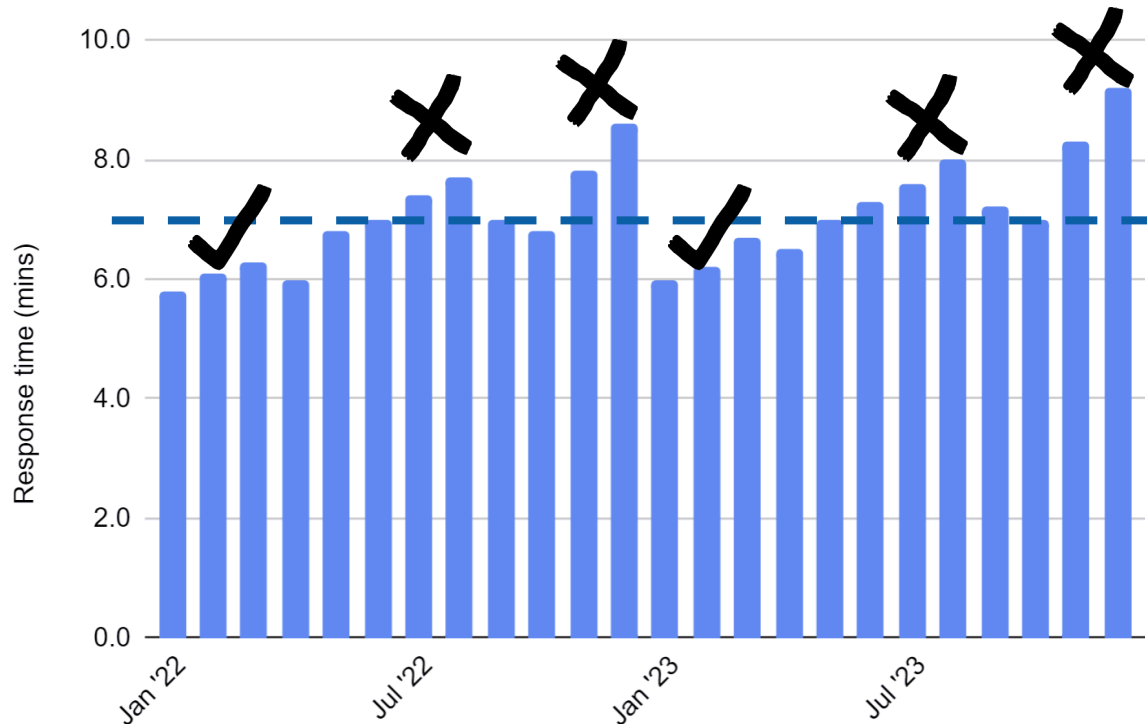


Waxay ku guulaysteen waqtiga jawaabta ee la beegsaday bilaha jiilaalka dhexe ilaa dabayaaqadiisa iyo guga hore.

Waxay ku guuldareysteen waqtiga jawaabta ee la beegsaday bilaha xagaaga iyo Nofeembar/Disembar.

Isticmaalka xogta (data)

Falanqayntan noocan ah waxay u horseedi kartaa isbeddelo ku yimaadda dhaqanka, tirada shaqaalaha, ama qaababka shaqada, si loo hubiyo in 7 daqiiqo si joogto ah loo gaadho.

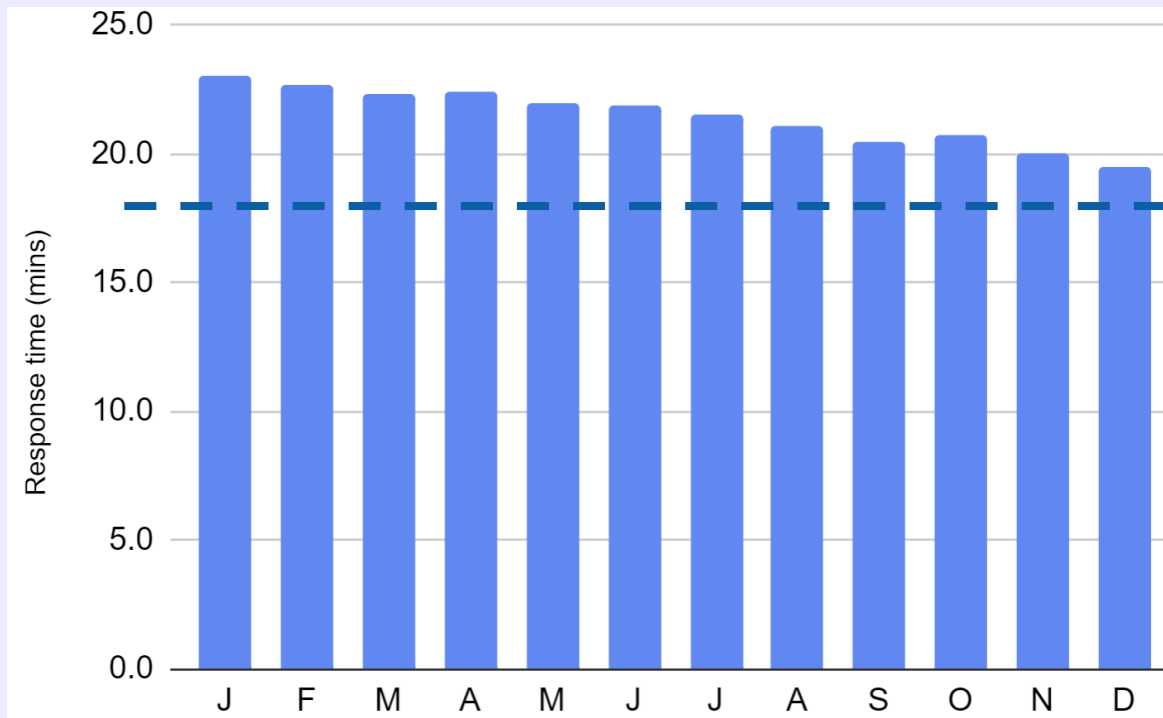


Waxay ku guulaysteen waqtiga jawaabta ee la beegsaday bilaha jiilaalka dhexe ilaa dabayaaqadiisa iyo guga hore.

Waxay ku guuldareysteen waqtiga jawaabta ee la beegsaday bilaha xagaaga iyo Nofeembar/Disembar.

Isticmaalka xogta (data)

Saldhigga ambalaaska wuxuu diiwaan geliyaa xogtan ku saabsan celceliska waqtiga ay ku tagaan wicitaannada istaroogga (stroke) (qayb labaad oo halis ah nolosha).

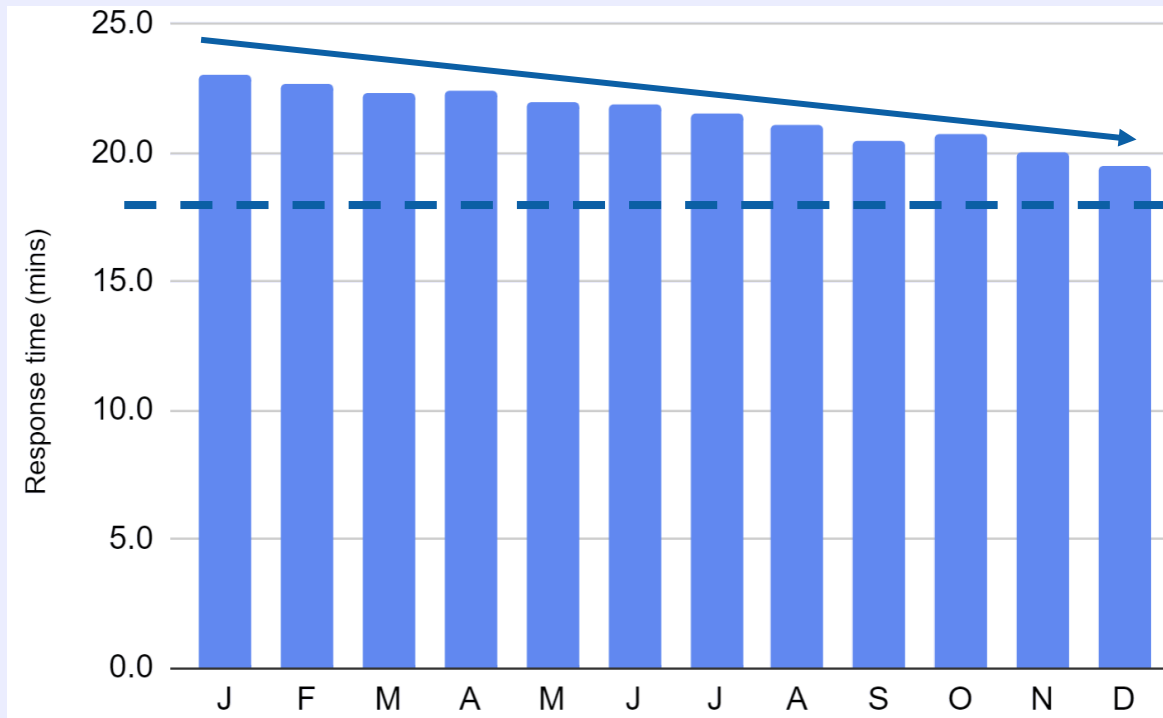


Waqtiga jawaabta ee la beegsaday:
18 daqiiqo

Maxaad ka soo gabagabeyn kartaa
xogtan?

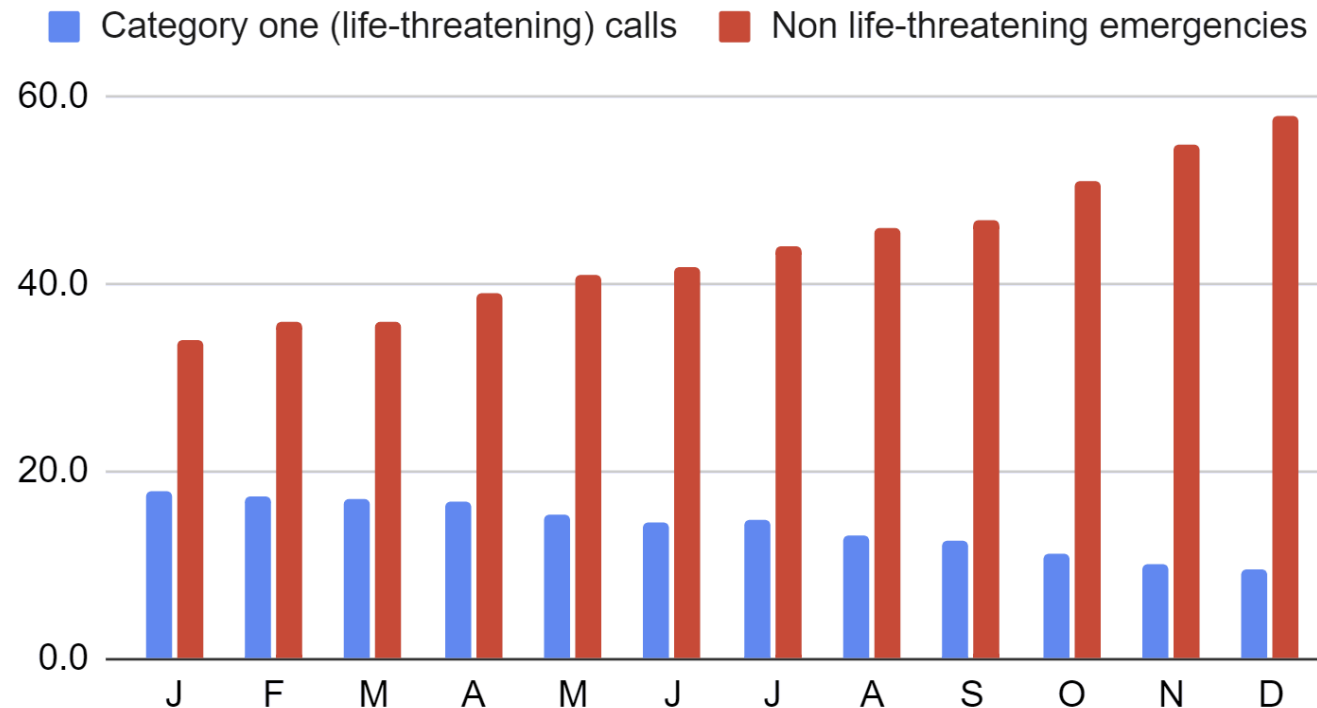
Isticmaalka xogta (data)

Saldhigga ambalaaska wuxuu diiwaan geliyaa xogtan ku saabsan celceliska waqtiga ay ku tagaan wicitaannada istaroogga (stroke) (qayb labaad oo halis ah nolosha).

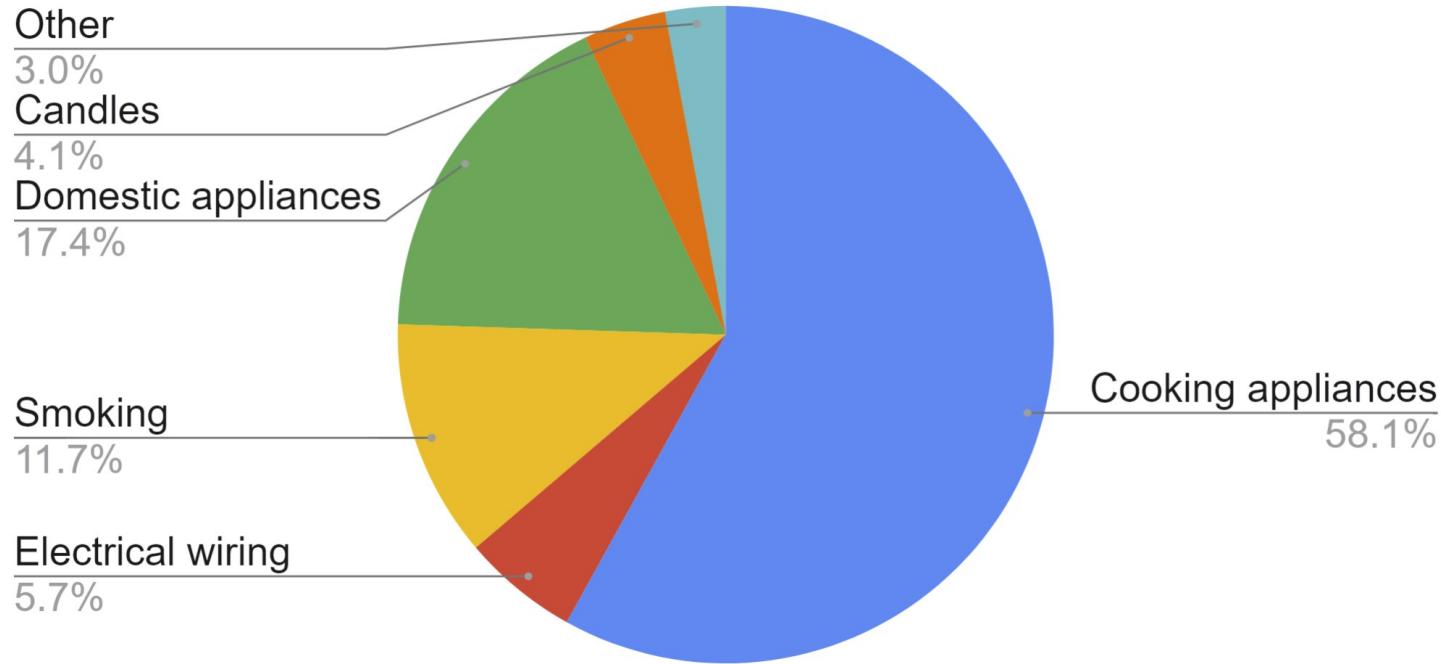


Saldhiggan weli ma gaadhayo waqtigiisa jawaabta ee la beegsaday, laakiin isbeddelku wuu fiicnaanayaa. Haddii isbeddelku sii socdo, waxaan filan karnaa inay gaadhaan 18 daqiiqo sanadka soo socda.

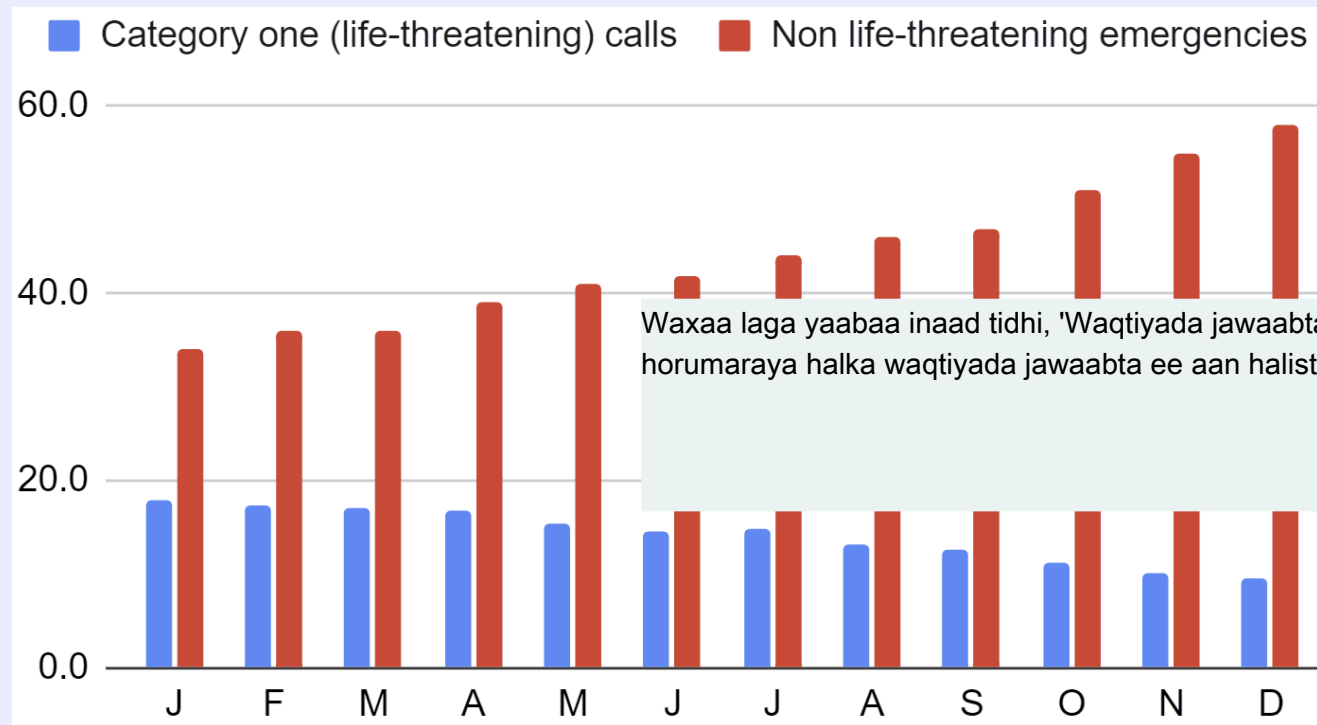
1) Saldhigga ambalaaska wuxuu diiwaan geliyaa celceliska waqtiga jawaabta ee wicitaannada degdegga ah hal sano. Waa kuwee qaababka (patterns) aad ku aragtaa xogtan?



2) Adeegga dab-demiska gobolka ayaa diiwaangelinaya sababaha dabka guryaha sanadka oo dhan waxayna soo saaraan jaantuskan. Talo sidee baad siin lahayd adeegga dab-demiska? Qor ugu yaraan saddex jumlad.

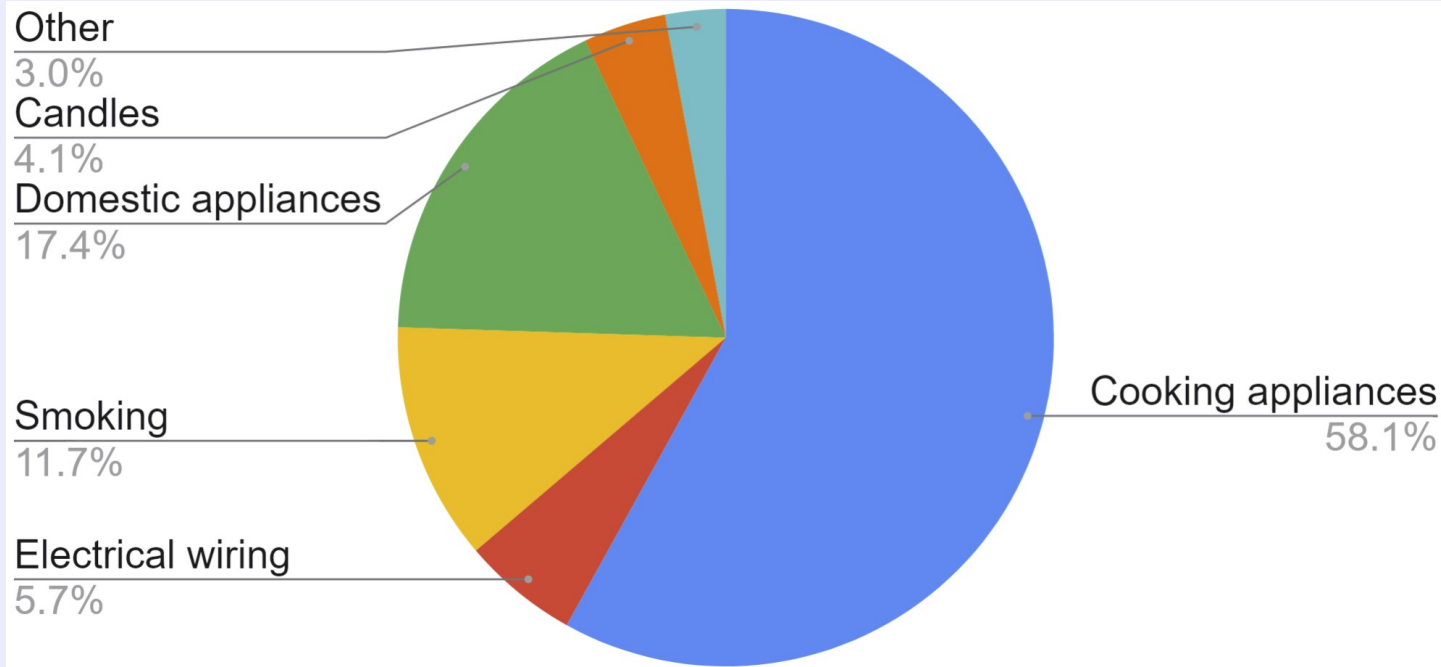


1) Saldhigga ambalaasta ayaa diiwaangelinaya celceliska waqtiyada jawaabta ee wicimada degdegga ah sanadka. Qaababkee ayaad ku aragtaa xogtan?

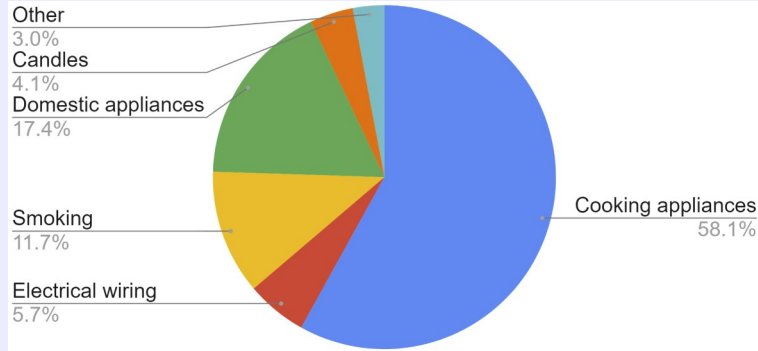


Waxaa laga yaabaa inaad tidhi, 'Waqtiyada jawaabta ee wicimada halista ah ayaa horumaraya halka waqtiyada jawaabta ee aan halista ahayn ay sii xumaanayaan.'

2) Adeegga dab-demiska gobolka ayaa diiwaangelinaya sababaha dabka guryaha sanadka oo dhan waxayna soo saaraan jaantuskan. Talo sidee baad siin lahayd adeegga dab-demiska? Qor ugu yaraan saddex jumlad.



2)



Waxaa laga yaabaa inaad tidhi:

- Gawaarida dab-demiska waxay u baahan yihiin inay si ku filan u qalabaysan yihiin qalabka saxda ah si ay wax uga qabtaan dabka qalabka karinta maadaama ay kuwaani ka yihiin in ka badan kala badh dabka guryaha.
- Qalabka (karinta iyo guriga) waxay ka yihiin qiyaastii saddex meelood meel dabka. Adeegga dab-demiska waxaa laga yaabaa inuu tixgeliyo tababar dheeri ah dab-demiyeaasha noocyada dabkan. Sidoo kale waxaa laga yaabaa inay tixgeliyaan olole dadweyne si loo kordhiyo wacyiga waxa sababa noocyada dabkan iyo waxa la qaban karo si looga hortago.

Xisaabta waxaa siyaabo kala duwan u isticmaala shaqaalaha jawaabta degdegga ah.

Dab-demiyeyaashu waxay isticmaalaan qaacidada (formula) si ay u xisaabiyaan waqtiga wareegtada ka hor inta aysan gelin dhismo gubanaya. Saraakiisha booliisku waxay isticmaalaan qaacidada (formula) si ay u xisaabiyaan xawaaraha baabuurta ku lug lahaa shilalka.

Dhammaan adeegyada degdegga ah waxay isticmaalaan xogta si ay ula socdaan waxqabadkooda waqti ka dib iyo inay hubiyaan inay diyaar u yihiin inay buuxiyaan baahida ay iyaga saaraan dadweynaha.