

MTH6157 Survival Models

Practice Questions – week 8 – Exposed to Risk

1. People attending a music festival on a farm in the west of England can only get there on buses provided by the festival organisers which operate from the nearest railway station to the farm. Each bus holds exactly 100 passengers and only departs for the farm when full. On the first day of the festival the arrival times of the buses at the farm are found to be 10:00; 10:15; 10:45; 11:00 and 11:30. Festival goers then have to wait at the farm entrance until 12:00 before being allowed onto the site. Whilst waiting, 4 attendees are chosen at random and given a “golden ticket” which includes a backstage pass. Calculate the rate of handing out golden tickets per person-hour stating any assumptions you make.
2. An actuarial student is checking a colleague’s calculation of exposed to risk and death rate at age 35 last birthday based on insurance policies in force for people that age on 1st January in the last 4 years. Unfortunately, the writing is very hard to read, and they cannot make out the number of policies in force at 1/1/18 or the exposed-to-risk.

Policies in force 1/1/15 age 35 last	1564
Policies in force 1/1/16 age 35 last	1566
Policies in force 1/1/17 age 35 last	1648
Policies in force 1/1/18 age 35 last	???
Exposed to Risk age 35 last birthday	???
Number of deaths 35 last birthday	4
q_{35}	0.000827

Assuming the calculations are correct, what are the missing numbers?