# Appendix A: Detailed description of outcome definitions

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| ID | Outcome name | Algorithm (variables used in parentheses) | Causes of missing values |
| 1 | Wait over 4 hours | = 1 if the time from admission to discharge (depdur) in an ED is greater than four hours. | depdur is missing (value of .) |
| 2 | Unplanned re-attendance within 7 days | = 1 if the patient (extract\_hesid) re-attended an ED within 7 days of discharge (difference in arrivaldate) and that reattendance was not planned (aeattendcat = 1 or 3). | aeattendcat is unknown (value = 9) |
| 3 | Untreated | = 1 if the attendance is unplanned (aeattendcat =1 or 3) and the patient leaves before being treated (aeattenddisp = 12) | Aeattendcat is unknown (value 9) or aeattenddisp is unknown (value 99) |
| 4 | ‘Unnecessary’ attendance | =1 if all of the following conditions are met:  1. Any investigations (invest\_nn) reported are for one of (have the first two characters) “urin analysis” 06, “pregnancy test” “21”, dental investigation” (22) “none” (24).  2. Any treatments (treat\_nn) are limited to (a recorded values of) “guidance/advice only-written” (221), “guidance/advice only-verbal (222), “recording vital signs” (30), “dental treatment” (56), “prescription/medicine prepared to take away (57), “none” (99)  3. Patient not treated or any follow-up limited to primary care (aeattenddisp values of) “discharged-follow up treatment to be provided by general practitioner (02), “discharged did not require any follow-up treatment” (03), “left department before being treated” (12)  4. Attendance is not by ambulance (aearrivalmodel doesn’t equal 1) | n/a, as it is not possible to disentangle nul from missing values. |
| 5 | Admission to ward | =1 if patient is admitted as an inpatient following ED attendance (aeattenddisp = 1 or 7). | aeattenddisp is unknown (value 99) |
| 6 | 30-day mortality | =1 if date of death of the patient is within 30 days after ED attendance. |  |
| 7 | Volume of attendances | Count of attendances per hour of day and day of week |  |