Introduction to Time-to-Event Data

COVID's toll on smell and taste: what scientists do and don't know

Researchers are studying the sensory impact of the coronavirus, how long it lasts and what can be done to treat it.

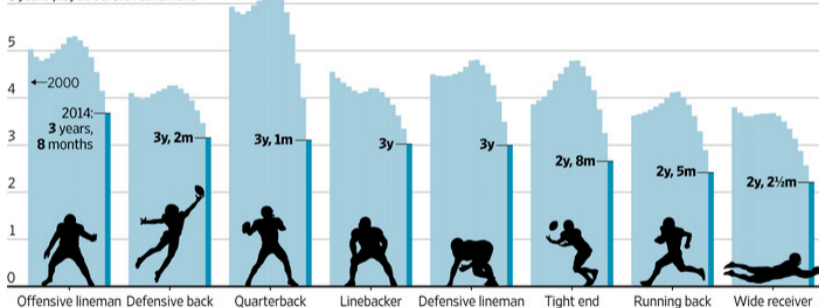## How quickly do the impaired senses return?

For most people, smell, taste and chemesthesis recover within weeks. In a study published last July[8], 72% of people with COVID-19 who had olfactory dysfunction reported that they recovered their sense of smell after a month, as did 84% of people with taste dysfunction. Claire Hopkins, an ear, nose and throat consultant at Guy's and St Thomas' Hospital in London, and her colleagues similarly observed[9] a speedy return of the senses: they followed 202 patients for a month, and found that 49% reported complete recovery over that time, and a further 41% reported an improvement.

Time in the NFL

The average length of an NFL career has seen a sharp drop since 2000. A look at the average number of years played before retirement, sorted by position.

6 years played before retirement

Offensive lineman
← 2000
2014: **3 years, 8 months**

Defensive back — 3y, 2m

Quarterback — 3y, 1m

Linebacker — 3y

Defensive lineman — 3y

Tight end — 2y, 8m

Running back — 2y, 5m

Wide receiver — 2y, 2½m

Note: All career length numbers were rounded down to the nearest whole number. Source: Pro-Football-Reference.com

Time to Event Data

Oftentimes, longitudinal data measures **the time until an event**, and want to know the **associated risk factors**.

The analysis of time-to-event data is often called **survival analysis**.

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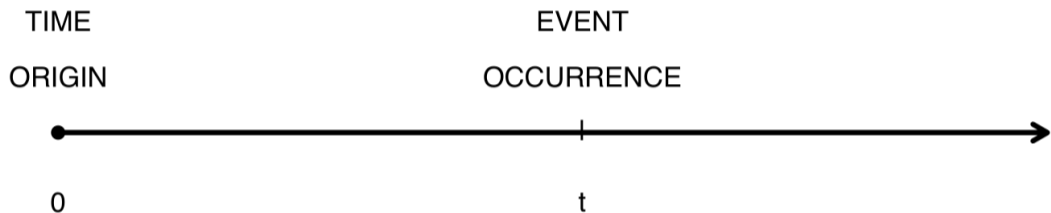
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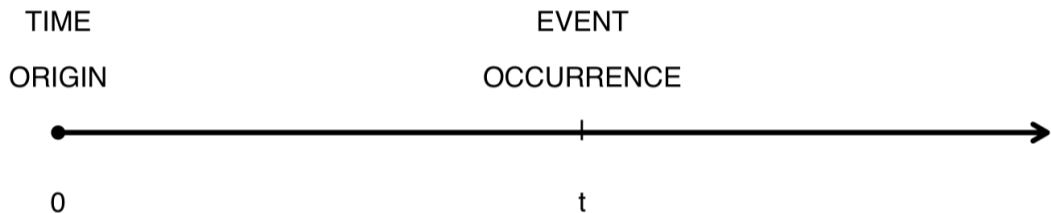
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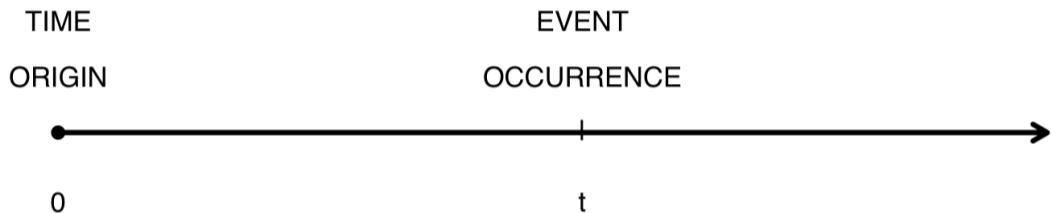
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TIME   EVENT

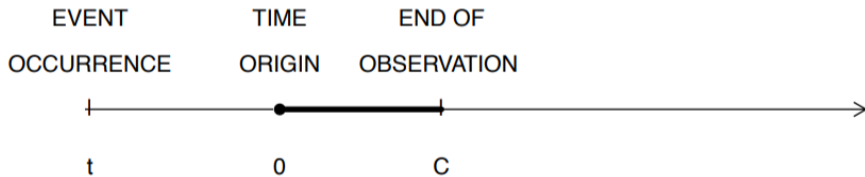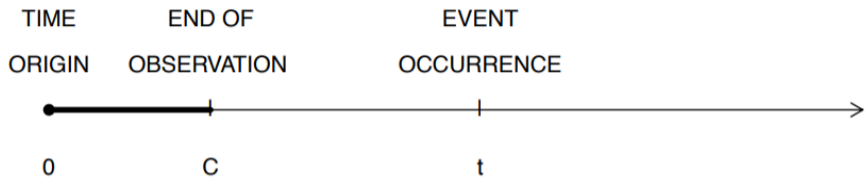ORIGIN   OCCURRENCE

0   t

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3. The **measurement scale** for time has to be selected.

Discrete and Continuous Time

We will differentiate based on whether the time scale is **discrete** or **continuous**.

What makes Survival Analysis special?

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    - ▶ **Random Censoring:** The censoring times are random quantities themselves.

Ignoring censoring will **bias** your results, and **ignores** much of the information you've collected.

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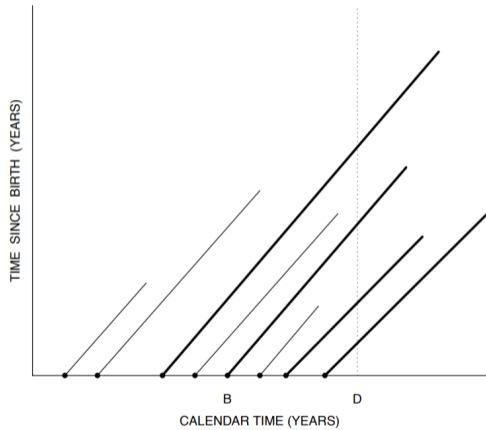
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- This is a type of **sampling bias**.

Under truncation you **must** perform **conditional inference** in order to make valid conclusions.

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- The priamry hurdles in conducting survival analysis are **censoring** and **truncation**.
- **Censoring** refers to individuals who **are included** but who do not have the event.
- **Truncation** refers to individuals who **are not included** because of their event time.