Background One in four infants have a hospital admission in their first year of life, of which 75% are unplanned. Clinically vulnerable infants have more planned and unplanned hospital contacts than other infants. They are therefore likely to have been disproportionately affected by restricted access to hospitals during the COVID-19 pandemic. **Objectives** To compare trends in planned and unplanned hospital contacts among clinically vulnerable and other infants before and during the COVID-19 pandemic. **Methods** We included infants born between September 2016 and March 2020 in Hospital Episode Statistics (HES). We defined clinically vulnerable infants by (i) long-term health conditions (chronic conditions or congenital anomalies), or (ii) adverse birth outcomes (low birth weight <2500g or preterm birth <37 weeks of gestation). We included characteristics and diagnoses recorded at birth, during subsequent hospital admissions, or as a cause of death. We described rates of planned and unplanned hospital admissions (excluding the birth admission) between January 2017 and March 2020 for infants with and without vulnerability. **Results** Of 2,184,114 infants in the study, 9.1% had a long-term health condition (6.8% had a chronic condition; 3.8% had a congenital anomaly), 9.3% had an adverse birth outcome (6.1% were low birth weight and 6.7% were preterm), and 16.4% had one or more. Between January 2017 and March 2020, an average of 0.12% of the infants had a planned and 0.69% had an unplanned admission each week. Infants with a long-term health condition were at a higher risk for hospital admissions with 16 times (RR: 15.38 (11.16–21.74)) as many weekly planned and over four times (RR: 4.56 (4.00–5.20)) as many weekly unplanned admissions as infants without these conditions. This was similar for infants with an adverse birth outcome who had twice as many weekly planned (RR: 2.36 (1.86–3.02)) and unplanned (RR: 1.75 (1.59–1.93)) admissions as infants without. Both weekly planned and unplanned hospital admissions started to fall two weeks before the first lockdown on March 23, 2020 for infants compared with the same period (averaged over 2017 and 2019); unplanned admissions fell more steeply. The reduction was greater for clinically vulnerable infants: there was a ten-fold decrease in planned admissions and a four-fold decrease in unplanned admissions for infants with long-term health conditions compared to those without. There was a three-fold reduction in planned admissions and a two-fold reduction in unplanned admissions for infants with an adverse birth outcome compared to those without. **Conclusions** The impact of the COVID-19 pandemic was greatest for unplanned admissions in infants with long-term health conditions. This may be due to restricted access to hospitals, fear of COVID-19 infection, lower rates of other infections, closer monitoring by carers at home, or deferred presentations. Reductions in planned admissions could reflect postponement of elective procedures. Further research is needed to establish the unmet needs that will result from the pandemic. Prioritisation of interventions to address unmet clinical need during lockdown should focus on clinically vulnerable infants.