abstract We model the population of AM CVn systems in the Galaxy and discuss the detectability of these systems with optical, X-ray and gravitational wave detectors. We concentrate on the short period ($P < 1500$ s) systems, some of which are expected to be in a phase of direct impact accretion. Using a self-consistent model for the star formation history and radial distribution of stars in the Galaxy plus simple models for the emission of optical and X-ray radiation from the AM CVn systems and interstellar absorption, we derive the sample of short-period AM CVn systems that can be detected in the optical and/or X-ray bands. At the shortest periods the detectable systems are all X-ray sources, some with periods as short as three minutes. At periods above 10 minutes most detectable systems are optical sources. About one third of the X-ray sources are also detectable in the optical band. We also calculate the gravitational wave signal of the short-period AM CVn systems. We find that potentially several thousand AM CVn systems can be resolved by the gravitational wave detector LISA, comparable to the expected number of detached double white dwarfs that can be resolved. We estimate that several hundreds of the AM CVn systems resolvable by LISA, are also detectable in the optical and/or X-ray bands.