Ovarian Cancer Mortality:

Basic Information	
1. What is being measured?	The mortality from ovarian cancer, ICD-10 C56-C574
2. Why is it being measured?	Surveillance of variation and trends in the mortality rates from ovarian cancer
3. How is the indicator defined?	The directly age-standardised rate of deaths per 100,000 female population Cancer site is coded according to the International Classification of Diseases, Edition 10 (ICD10) Mortality data are provided by the Office for National Statistics (ONS) and relate to all deaths registered with ovarian cancer mentioned as an underlying cause of death. Data are reported according to the calendar year in which the death was registered and not the year it occurred.
4. Who does it measure?	It measures the rate of ovarian cancer deaths in women of all ages
5. When does it measure it?	Cancer Network level – 3 year cohorts – 2001-2003 to 2009-2011 PCT level - 3 year cohorts – 2001-2003 to 2009-2011
6. Does it measure absolute numbers, proportions or rates?	The directly age-standardised rate of ovarian cancer deaths per 100,000 female population, using the European Standard population
7. Where does the data come from?	The data is taken from the UK Cancer Information Service (UKCIS). This contains all cancer deaths for England and Wales, compiled by ONS from death certificates, and for Scotland and Northern Ireland where mortality data is compiled separately by the General Register Office for that country from death certificates.
8. How accurate and complete are the data?	Mortality statistics in England and Wales are derived from the registration of deaths certified by a doctor or a coroner. The data pass through a number of processes before becoming usable for analysis. These processes are complex, and involve a wide range of people, organisations and computer systems. Please see the following link for more details http://www.ons.gov.uk/ons/rel/vsob1/mortality-statistics--deaths-registered-in-england-and-wales--series-dr-/2009/mortality-statistics-deaths-registered-in-2009.pdf
9. Are there any caveats/ problems/	See link in note 8, above

weaknesses?	
10. What methods are used to test the meaning of the data and variation?	**Rate:** Direct standardisation allows the comparison of mortality rates in populations which have different age-sex structures. The directly age standardised rate is calculated by taking the age-specific rates and applying them to the age distribution of a hypothetical population, in this case the European Standard Population. Confidence intervals (CIs) are also calculated for each rate. **Count:** In all tables the 'count' is the number of deaths that were registered per year. **Lower and Upper Confidence Limits (LCL and UCL):** Confidence intervals are used as a measure of uncertainty in the estimated proportions. The upper and lower limits of the interval show how big a contribution chance may have made to a particular statistic. The 95% confidence intervals quoted give the range in which the proportion in question would fall 19 times out of 20, were it possible to repeat the analysis. When comparing the rates of different groups, the CIs can be compared to determine if the range of values overlap. If the CIs do not overlap then the difference between the rates is said to be statistically significant. Example of interpretation: Areas are said to have a statistically significantly higher or lower than expected number of deaths of ovarian cancer, given the age and size of the population. **Area Profile:** Spine Chart: The area profile presents a spine chart which allows a comparison of the local value (represented by a circle) against the national average (represented by a red line in the middle of the chart) and regional average (where available, represented by a diamond), but also where the local area lies in relation to the range of values for all the other local areas. The darker grey shading of the bar represents the 25th to 75th percentile of the range of values. Map: The map is coloured according to whether the rate is statistically significantly higher or lower than the England average, higher/lower than the national average but not significantly so and the same as the national average. The statistical significance tested by the CIs is different to the method described below for funnel plots and may present the same area differently in terms of statistical significance when compared to the national average.

	Example interpretation: The symbol in the spine chart is green (better) when mortality of ovarian cancer is statistically significantly lower than the England average; or red (worse) when the mortality is statistically significantly higher than the England average. Statistical significance is to the 95% confidence level. The symbol is orange when the mortality of ovarian cancer is not statistically significantly different to the national average. **Funnel Plot:** Funnel plots have become a preferred method of presenting comparisons between geographical areas or institutions in public health. This is opposed to the more conventional use of 'caterpillar' plots which visually imply a ranking of areas based on good or bad performance. In any process or system, variation is to be expected; the funnel plot approach makes it easier to identify which data points indicate areas that may be worthy of further investigation. Simple statistical methods are used to define limits of expected variation known as control limits. The group average is used as the estimate of expected 'performance' and the best estimate of expected variation around this average is both/either ± 2 standard deviations (SDs), equivalent to 95% confidence intervals, and/or ± 3 SDs, equivalent to 99.8% confidence intervals. Those areas that fall outside of these control limits are deemed to be statistically significantly different from the group average. More information on funnel plot methodology can be found in the following references: Spiegelhalter DJ, 2005. Funnel plots for comparing institutional performance. Statistics in Medicine, 24: 1185-1202. Association of Public Health Observatories (APHO), 2009. Statistical Process Control Methods in Public Health Intelligence, Technical Briefing no. 2, Available at http://www.apho.org.uk/resource/item.aspx?RID=39445 Map: The map is coloured according to where the areas fall relative to the 2 and 3 standard deviation funnels. Example of interpretation: Areas where ovarian cancer mortality rates are statistically significantly lower (better) than the England average fall below the horizontal green line (national average) and outside of the funnels. Those areas where ovarian cancer mortality is statistically significantly higher (worse) than the national average fall outside of the funnels above the horizontal line. Areas where the mortality of ovarian cancer is not statistically significant fall inside the inner funnel around the horizontal line. Those areas that fall outside of the funnels in the funnel plots may require further investigation into the reasons for the statistically significantly low or high mortality rates. Particular attention should be paid to those areas falling outside both funnels.

	Double map: Scatter Plot: The double map option displays a scatter plot of the association between the two chosen rates e.g. ovarian cancer mortality and deprivation. The correlation coefficient (r) statistic displayed at the top of the scatter plot is Pearson's correlation coefficient, often called the correlation. It measures the degree of 'straight-line' association between the two indicators and can take any value between -1 (perfect negative correlation) and 1 (perfect positive correlation). A value of zero indicates no correlation. Map: In the map, the range of values for mortality is split into five groups (quintiles), and not according to statistical significance. Interpretation: If all the points lie very close to the straight line on a slope indicating, that as one variable increases (or decreases) the other increases (or decreases), then it can be said that there is a strong association between the two indicators. If the points are more scattered, but still in a straight line, would indicate that there is a weaker relationship. Interpretation of the relationship between two indicators should be made carefully; it does not mean there is a 'causal' relationship between the two indicators. **Single map:** Map: The map is coloured according to whether the rate is statistically significantly higher or lower than the England average, higher/lower than the national average but not significantly so and the same as the national average as based on comparison of confidence intervals. Time Series: The time series animation allows the user to view how the map changes for each indicator that has time series data, according to whether the rates are statistically significantly different or not.
11. Geography provided in this toolkit	Since April 2013 the NHS health boundaries for Primary Care Trusts, Cancer Networks and Strategic Health Authorities have been become non-operational and have been replaced by other organisational structures responsible for the commissioning and performance management of cancer services, namely Clinical Commissioning Groups, Local Area Teams and Strategic Clinical Networks. However, in the absence of established boundaries and available data for these new organisations we have only been able to present sub-national data for

	the old organisations. The old organisations still retain some currency and relevance to the commissioning and public health structures as redefined and this is explained below: PCTs Many PCTs are coterminous with the Clinical Commissioning Groups and therefore statistics at PCT level for these CCGs will still be largely relevant. Cancer Networks Cancer Networks were formed in order to oversee and organise the local implementation of the Cancer Plan and Cancer Reform Strategy for the areas within their jurisdiction. There were 28 Cancer Networks in England which have now been replaced by 12 Strategic Clinical Networks which will provide support to cancer networks 'nesting' within their boundary. In consultation with the Gynaecological Site Specific Reference Group (SSCRG) it was decided that cancer network levels figures would be carried forward in the absence of any other relevant boundary, particularly as this will provide data for on-going peer review and whether improvements are being made over time. NHS Strategic Health Authorities (SHA) Strategic Health Authority data is available for the mortality, mortality and survival data. However, these organisation no longer exist and the figures serve to provide a regional comparison in the absence of any other available data at present. The values for the SHAs can be seen by toggling the map and comparison button on each map. In the health profile, the regional value is shown as a grey diamond. Some cancer networks cross over more than one SHA boundary, the regional average is used for each cancer network and PCT where the majority of the area resides. However, when filtering in the, single, double and health profile map, the cancer networks that have a significant area falling within the boundary of the SHA are shown. The SHAs can be highlighted on the map by ticking the box in the legend. The borders will then be highlight in red.
12. Further data availability	The UKCIS holds a more extensive dataset and can be accessed via NHSnet only. If you wish to request a login for the UKCIS please visit your regional cancer registry website. • Northern and Yorkshire Cancer Registry and Information Service (www.nycris.nhs.uk) • North West Cancer Intelligence Service (www.nwcis.nhs.uk) • Trent Cancer Registry (http://www.empho.org.uk/tcr/aboutUs.aspx) • West Midlands Cancer Intelligence Unit (www.wmpho.org.uk/wmciu) • Eastern Cancer Registration and Information Centre (www.ecric.nhs.uk)

	• Oxford Cancer Intelligence Unit (www.ociu.nhs.uk) • Thames Cancer Registry (www.tcr.org.uk) • South West Cancer Intelligence Service (www.swpho.nhs.uk)
13. Frequency/ timeliness of data updates	Mortality rates are published every year and are usually around 12 months behind the current year.
14. Disclosure control	No rates have been suppressed as a PCT is the smallest geography at which ovarian cancer mortality rates based on counts less than 5 are not deemed potentially disclosive
15. Rationale for inclusion	Surveillance of variation and trends in the mortality of ovarian cancer allows health care professionals to plan resources for the care of ovarian cancer patients. Measuring the mortality of ovarian cancer also allows public health professionals to examine the possible underlying factors in a given population which may explain variation and trends.