SONOGRAPHIC CORRELATION OF FETAL NECK CIRCUMFERENCE AND AREA WITH GESTATIONAL AGE AMONG PREGNANT WOMEN IN PORTHARCOURT, NIGERIA.

A POST FIELD DISSERTATION

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Abonyi Everistus Obinna.

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ABSTRACT

Fetal gestational age calculation has been found to be influenced by differences in race. Discrepancy has been noted on previous studies done on fetal neck circumference and area measurements which were attributed to racial difference. This study was aimed at correlating fetal neck circumference and area with common gestational age predictors in second and third trimesters and to determine whether there is racial difference between Nigerians and Caucasians.

This prospective cross sectional study was done on 723 pregnant patients between 14-40 weeks of gestation selected using convenient sampling method at Braithwaite Memorial Specialist Hospital Portharcourt. Axial fetal neck circumference and area values were calculated as mean of three separate measurements. Other sonographic measurements includes biparietal diameter, femur length, abdominal circumference and head circumference.

Mean fetal neck circumference and area values at 40 weeks gestation are 14.32±0.76cm and 15.55±1.68cm^2 respectively. High values of Pearson correlation coefficient between fetal neck circumference and area and other biometric parameters signify strong correlation. Regression model equations relating FNC and FNA with other biometric parameters were generated as follows.

FNC (cm) = 21.978 +0.065(FL) + 0.021(BPD) + 0.064(AC) + 0.259(HC).

FNA (cm^2) = -287.917+ -1.033(FL) – 1.600(BPD) + 3.159 (AC) + 2.687(HC).

No statistical significant difference was noted in fetal neck circumference measurement between Nigerian and Caucasians ($p < 0.05$) while there is statistical significant difference in fetal neck area measurement between Nigerians and Caucasians ($p = 0.05$)

Nomograms generated can be used to determine gestational age in late pregnancy and rule out neck anomalies associated with neck size.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The neck represents anatomically a small part of the human body between the head and the thorax. Due to its unique position, it conveys vital structures that communicate between the head and other parts of the human body. It contains conduit of respiration, deglutition and blood to and from the brain as well as important endocrine and neural structures. The structural development of the neck occurs between the 3rd and 8th weeks of gestation. According to Johnston (1990), the five pairs of brachial arches corresponding to the primitive vertebral gill bars that form on either sides of the pharyngeal foregut on the day 22 are the embryologic basis of all the differentiated structures of the head and neck.

The gestational age refers to the length of pregnancy after the first day of the last menstrual period. The importance of accurate gestational age in pregnancy cannot be over emphasized. According to Peek et al (1994), the estimation of pregnancy date is important to the mother who wants to know when to expect the birth of her baby, and for her health care providers, so they may choose the times to perform various screening test and assessments. Accurate pregnancy dating assists obstetricians in appropriately counseling women who are at risk of preterm delivery about the likely neonatal outcomes. According to Hall and Carr-Hill (1985), uncertain gestational age has been associated with adverse pregnancy

outcome including low birth weight, spontaneous preterm delivery and perinatal mortality independence of maternal characteristics. Pregnancies erroneously thought to be preterm may lead to prolong hospitalization and risk of dangerous medication including tocolytic therapy. It is also essential in the evaluation of fetal growth and detection of intrauterine growth retardation. Gottlieb and Galan (2008) asserts that accurate gestational dating is one of the most important assessment a health care provider make in pregnancy, giving that all of the various management strategies are dependent on knowing where the patient is in gestation. It helps in scheduling invasive diagnostic tests such as chorionic villus sampling or amniocentesis as appropriate timing can influence the safety of the procedure. Also correct biomedical serum screening interpretation depends on the accuracy of dating of pregnancy. Accurate pregnancy dating also helps in the counseling of patient regarding the option of pregnancy termination.

Different parameters have been employed in the calculation of the gestational age of fetus and these includes-

Ovulation date: Most women who know when they ovulate based on formal methods and record keeping such as daily temperature check and on physical symptoms such as pain upon ovulation or observation of changes in vaginal mucus can use it in calculation of their due dates. It is important to note that this method is not without a flaw as variations in the ovulation period among women complicates the matter. Walker et al (1988) supported

this claim when he evaluated 75 ovulation cycles using luteinizing hormone level as a biochemical marker and found that ovulation occurs within a range of 8-31 days after the last menstrual period. Wilcox et al (1993) also stated that the time of ovulation varies greatly in relation to the menstrual cycle, both from cycle to cycle and individual to individual.

Conception date: Calculating expected date of delivery based on conception date is normally used when the conception is medically managed and supervised through technique such as artificial insemination, although this involves an invasive technique.

Last Menstrual Period (LMP): Expected date of delivery is typically calculated based on the date the last menstrual period began according to the mother's report. This forms the basis of Franz Naegele's rule which states that the standard definition of gestational term is 280 days from the date of conception to the date of baby's birth, or 40 weeks from the first day of the mother's last menstrual period (Durham, 2002). This definition is on the assumption that the mother ovulates on the 14^{th} day of the 28 days menstrual cycle. He, therefore use this formula to calculate the expected date of delivery. LMP + 7 days – 3 months = Expected date of delivery. Durham (2002) also made us to understand that the observation made by Franz Naegele was not based on empirical data. Calculation of gestational age using last menstrual period has its own shortcomings. This is because of varying length of follicular phase and the fact that many women do not have regular menstrual cycle. In a study by Kramer et al (1988) on the

validity of gestational age estimation by menstrual dating in term, preterm and post term found that out of 11,000 pregnant women who underwent early ultrasound, one fourth of all the infant who would have been classified as preterm and one eight of all the infant who would have been classified as post term by menstrual history would have been misdiagnosed. Similarly Campbell et al (1985) demonstrated that of more than 4,000 pregnant women, 45% were not certain about their LMP as a result of poor recall of date, irregular cycles, bleeding in early pregnancy or oral contraceptive use within two months of conception. Geirsson and Busby-Earle (1991) also stated that certain last menstrual period date may not provide a reliable estimate of gestational age. They found out that10-45% of pregnant women cannot provide useful information about their LMP; and 18% with certain menstrual dates have significant difference between menstrual and ultrasound dating.

Fundal Height Measurement: Measurement of symphysis- fundal height which spans from the pubic symphysis to the fundal part of the uterus was used to estimate the gestational age of a fetus. This measurement although, may be a useful adjunct, it does not provide reliable guide as a sole predictor of gestational age. Gardosi and Frances (1999) found that the measurement of fundal height is influenced by the amniotic fluid volume, placenta thickness, myometrial wall thickness, maternal abdominal wall fat and the relationship of the uterus with the bony pelvis.

Quickening: This is the first feel of fetal movement as noticed by the mother. It occurs from about 16-20 weeks of gestational age and has been used as a rough estimation of fetal age.

Also the detection of fetal tone using stethoscope at 18-20 weeks of gestational age is also employed in the estimation of fetal gestational age. Also, this can be useful adjunct, but carries potential error when used as a sole predictor of gestational age.

Ultrasound Scan: The use of ultrasonography has played a vital role in the estimation of fetal gestational age. Kalish and Chervenak (2002) stated that ultrasound assessment of gestational age has become an integral part of obstetric practice in recent times. Currently, the sonographic estimation of gestational age is derived from calculation based on fetal measurement and serves as an indirect indication of gestational age. Hadlock et al (1984) states that numerous equations regarding the relationship between fetal biometric parameters and gestational age has been described and has proved early antenatal ultrasound to be an objective and accurate means of establishing gestational age. The biometric parameters used in the estimation of fetal gestational age are as follows:-

Gestational Sac Diameter (GSD): The gestational sac is the earliest sign of pregnancy in ultrasound. The gestational sac is a fluid-like sac surrounded by an echogenic rim- the developing chorionic villi within the endometrial cavity. According to Crispigny et al (1988), the gestational sac is visualized as early as five menstrual weeks using transvaginal scan. Three

measurements are made which includes the long axis, anterior-posterior diameter and transverse diameter. The average of these three measurements are calculated and then used in the estimation of fetal gestational age.

Crown Rump Length (CRL): This is the measurement of the fetal length from the tip of the cephalic pole to the tip of caudal pole. Callen (2000) advised that three adequate CRL measurements should be taken and the average used in the determination of gestational age. The accuracy of the crown rump length has been well documented in the medical literatures. Specifically, gestational age can be estimated safely with a maximal error of 3-5 days in the first trimester using crown rump length according to Kalish et al (2004) and Wiser et al (1994). Chaudhuri et al (2013) noted that in twin pregnancies, the crown rump length of the smaller fetus is more accurate in determining gestational age.

Biparietal Diameter (BPD): The BPD is imaged in the transaxial plane of the fetal head at the level of thalami in the midline, equidistance from the temporoparietal bones and usually the calvum septum pelucidium anteriorly. The BPD was the first fetal parameter to be utilized in the determination of gestational age in the second trimester before more recent studies have evaluated the use of several other biometric parameters. Gestational age estimation using a single biparietal diameter has an accuracy of ± 10-11 days in the second trimester although, recent study by Wu et al (2012) found that biparietal diameter share similar accuracy with

CRL in late first trimester ultrasound estimation with additional advantage of lower random error.

Femur Length (FL): The femur length measurement is taken along the long axis of the bone. A straight measurement of the osseous portion is taken from one end to the other end disregarding bone curvature. The accuracy of FL and BPD are similar in the third trimester although there is controversy regarding the accuracy of FL prior to 26 weeks of gestation. Mongeli et al (2003) stated that in late second trimester, the femur length can be used and is nearly as accurate as head circumference and biparietal diameters.

Abdominal Circumference (AC): The abdominal circumference is obtained in the transaxial view of the abdomen at the level of the fetal liver, using the umbilical portion of the left portal vein as the landmark. The fetal stomach is at the same level which is slightly caudad to the fetal heart and cephalad to the kidneys. The abdominal circumference is most useful in the determination of fetal weight. The accuracy of abdominal circumference in the estimation of gestational age is less than all other predictors of gestational age at term (Benson and Doubilet, 1991).

Apart from these traditional predictors of gestational age, there are other ancillary biometric parameters used in the estimation of fetal gestational age. These include- ear size, orbital diameter, cerebral diameter, placenta thickness, fetal neck circumference, fetal neck area and foot length. Benson and Doubilet (1991) noted that the accuracy of all the traditional predictors of gestational ages worsen progressively as pregnancy advances to the third

trimester. These show that none of these parameters can be reliably used to estimate gestational age in third trimester as there are gross variations in growth from one fetus to another. It is due to these significant margins of error in ultrasound measurement that some school of thought advised that gestational age calculation should not be changed from that calculated from the last menstrual period unless the discrepancy is more than two weeks. Also, as a result of these variations, Gottlieb et al, (2008), observed that in addition to the traditional biometry, ancillary biometric and non biometric measurement can help narrow the biological variability between fetuses. Fetal neck circumference and area seems to be good ancillary biometric parameters which are easier to identify and measures. Hata et al (1988) and David et al (2007) found a linear increase in fetal neck circumference and area with increase in gestational age. There was discrepancy noted in the two studies from 32 weeks of gestation upwards where the measurements from David and colleagues become higher than that of Hata and colleagues. This discrepancy was attributed to either morphological difference in the population studied or enhancement in the sonographic resolution of the ultrasound machine used in recent times compared to that used two decades ago. Mittendorf et al (1990) also observed that gestational age of an average healthy, white, private care, and primiparous Irish American woman average 288 days from LMP to birth; 8 days longer than that of Franz Naegele's rule. They further concluded that ethnicity among other factors affects the gestational age of fetus. Degan (2001) also supported this

idea when he stated that various epidemiological factors involved in the fetal growth should be considered and specific chart for different communities should be used when possible. This may be the reason why Kurtz (2007) stated that there were many well established charts that has been in use for a long time; however, marked difference between population sometimes forces researches to build nomograms for different race, hence the need for this study. This study is therefore aimed at creating a reference range nomograms of the axial neck circumference and area in second and third trimesters in a Nigerian population.

1.2 Statement of Problem

1. There seems to be racial difference in fetal neck circumference and area measurements in previous literatures (David et al 2007), thus the need to have an indigenous nomogram.

1.3 Research Questions

1. Can fetal neck circumference and area be used as accurate predictor of gestational age in second and third trimester?
2. Is there any geographic variation in the fetal neck circumference and area between Blacks (Nigerian) and the Caucasians (USA)?

1.4 Objectives of the study

1.41 General Objective

1. To measure fetal neck circumference and area as sonographic indices for determining gestational age in second and third trimesters.

1.42 Specific Objectives of the Study

1. To establish nomograms of fetal neck circumference and area for determining gestational age in second and third trimesters in a Nigerian population.

2. To compare the results of this study with that obtained from the Caucasians (USA).

1.5 Significance of the Study

1. Fetal neck circumference and area nomograms created may be used an indigenous biometric parameters for the estimation of fetal gestational age in second and third trimesters.

2. Fetal anomaly associated with increase or decrease in the fetal neck circumference and area can be identified when measuring the neck circumference and area.

1.6. Scope of Study

This study was conducted at the radiology department of Braithwaite Memorial Specialist Hospital (BMSH) in Portharcourt, Nigeria.

1.7 Operational Definition of Terms

Ultrasound: This is a mechanical longitudinal wave with frequency above the range of human hearing which is greater than 20 KHz. It is produced by the oscillatory motion of the particles in a medium creating region of compression and rarefaction (Sanders, 2007).

Transducer:

This is a device which converts electrical energy to mechanical energy and vice versa. It comes in different frequencies- typically 2.5, 3.5, 5, 7 and 10 MHz with decrease in penetration as frequency increases. Transducers can come in many formats which includes- linear array, vector, sector and curved array and can also be classified based on the purpose such as transabdominal, transvaginal, transoesophageal, transluminal and transcardiac transducers.

Brightness Mode:

This is one of the ultrasound image displays. Here the amplitude modulated signals are converted into dots, which vary in brightness depending on the strength of the returning echo.

Gestational age:

The gestational age is the period of time from the day of conception to the day of delivery. The gestational age is estimated to be 40 weeks from the date of last menstrual period to the time of delivery.

Trimesters:

Trimesters means three months. Pregnancy is subdivided into three trimesters. The first trimester starts from the first month to the third months of the pregnancy while second trimester starts from the fourth month to the sixth month. The third trimester starts from the seventh month to the ninth month.

Fetal Neck:

The fetal neck is the part of the body that connects the head to the thorax. It serves as a conduit to several organs and contains muscles, nerves, vascular bundles and the cervical spines.

CHAPTER TWO

LITERATURE REVIEW

2.1: Sonographic Anatomy of the Fetal Neck.

According to Mernagh et al., 1999, when attention is paid to the details of normal fetal head and neck anatomy, abnormalities that normally would be missed at prenatal ultrasonography can be routinely diagnosed. The fetal neck which connects the head to the thorax can be visualized sonographically from 11^{th} weeks of gestational age. Fetal neck is routinely examined in the sagital and transverse axial views. In sagital view from the anterior aspect of the neck to the posterior aspect, the neck has tiny linear echogenic border which represent the anterior fetal skin of the neck. The skin is immediately followed by an isoechoic structure which represents the anterior subcutaneous tissue. This is immediately followed by two tiny tubular structures that represent the fetal trachea and esophagus although these two structures may not be visualized all the time as this depends on the resolution of the ultrasound machine. Posterior to these are double echogenic structure with an echopenic centre which represents the cervical vertebrae. Posterior to this is an isoechoic structure which represents the posterior subcutaneous tissue layer which is then followed by a tiny echogenic line which represents the skin of the neck.

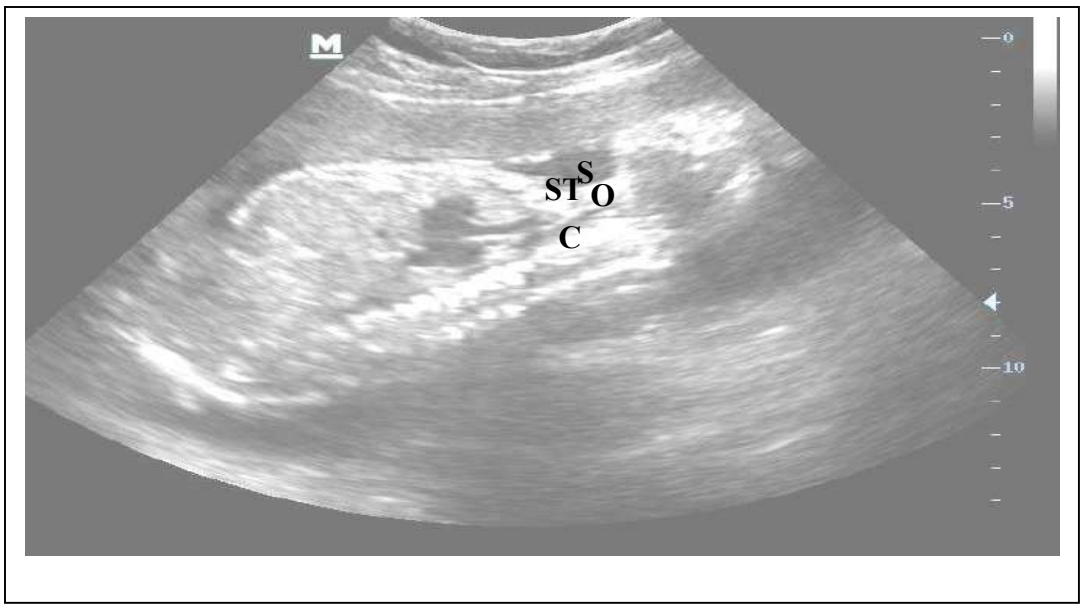
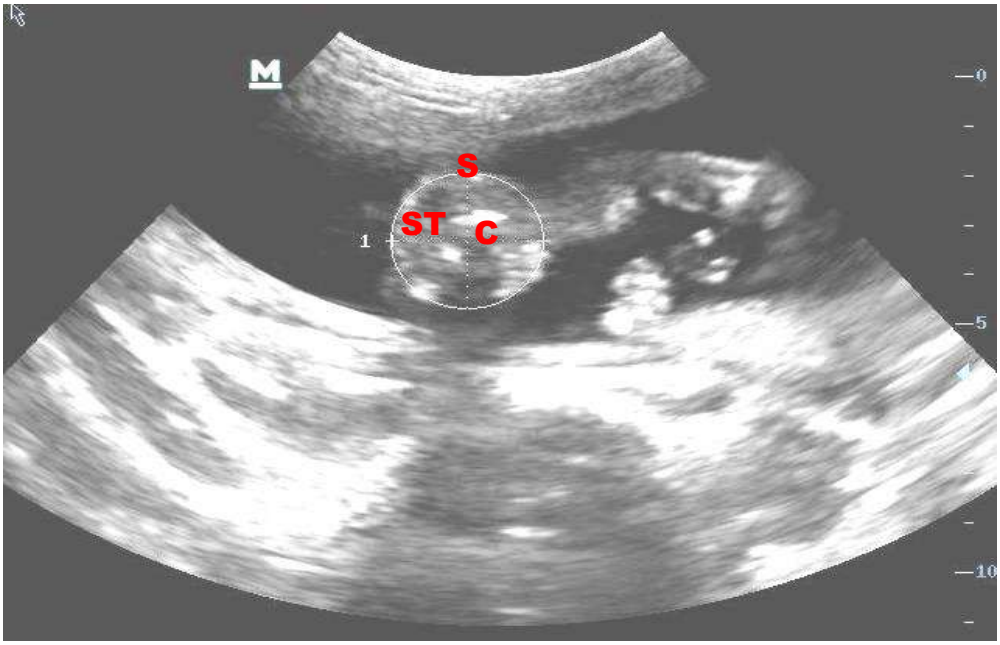


Figure 1: Longitudinal image of the fetal neck

In transverse view, the fetal neck appears as a circular structure with a tiny echogenic rim which represents the skin of the neck. This is followed by an isoechoic structure which represents the subcutaneous tissue of the neck. Centrally, the fetal neck has an echogenic roughly rounded mass with posterior acoustic shadowing with an echopenic centre which represents the cervical spine.



Figures 2: transverse image of the fetal neck

Sonograms showing the anatomy of the fetal neck. (S= Skin, ST= Subcutaneous tissue, C= Cervical spine, O= Esophagus).

2.2: Shortcomings of the traditional age predictors.

Gestational age determination are usually done by the use of traditional predictors of gestational age which includes- Gestational sac diameter (GSD), Crown rump length (CRL), Biparietal diameter (BPD), Abdominal circumference (AC) and Femur length (FL) measurements. Many literatures abounds which points to the shortfall of these predictors especially as pregnancy progresses to third trimester.

Johnsen et al (2006) in their work "Longitudinal reference chart for growth of the fetal head, abdomen and femur" using regression analysis and multilevel modeling as statistical tool found that the reference percentiles for the growth of mean abdomen diameter (MAD), abdominal circumference (AC) and femur

length (FL) show continuous growth in weeks 10-40 weeks while biparietal and head circumference show slight blunt growth towards the end of pregnancy. They also found that maternal weight has positive effect on all the variables (HC, FL, BPD and MAD) while maternal height has positive effect on FL, AC, BPD and HC.

Simic et al (2010) in their work "Maternal obesity is a potential source of error in mid trimester ultrasound estimation of gestational age" noted a discrepancy of more than 7 days between menstrual date in 25% of women and is more common in cases with BMI > 30, in whom the estimated due date is often postponed.

Hadlock et al (1984) stated that fetal biometry in the third trimester is subject to much greater individual size variation than in second trimester; its accuracy for gestational age assignment is reduced considerably, and estimates may have confidence intervals of plus or minus 3 weeks.

Synnove et al (2004) in their prospective cross sectional study of fetal age assessment based on ultrasound head biometry and the effect of maternal and fetal factors found that using BPD and HC before 20 weeks, the new chart has 3-8 days higher gestational age assessment that the chart presently in use and less than 1 day difference compared to other recent established charts. They therefore, concluded that maternal and especially fetal factors affect gestational age assessment using BPD but less for HC method.

Johnsen et al (2005) in their prospective cross sectional study to assess the effect of fetal and maternal factors on fetal age assessment based on femur

length at 10-25 weeks of gestation and femur length and head circumference ratio noted that maternal age modestly influence gestational age assessment whereas smoking, height, body mass index, multiparity, fetal sex, cephalic index and breech presentation have no impact. Only fetal sex influence FL and HC ratio.

It is because of the fetal and maternal factor that Gottlieb et al (2008) stressed the need for ancillary biometric and non biometric measurement in the prediction of gestational age as these helps to reduce biological variability between fetuses. Therefore the need to generate fetal neck circumference and area charts in second and third trimesters as ancillary biometric measurement to the traditional predictors cannot be over emphasized.

Although few literatures in Japan and United States of American were documented on the fetal neck circumference and area, none has been document in Nigeria or Africa population in the reviewed literatures to the researcher's best of knowledge.

2.3 Fetal Neck Circumference and Area as Predictors of Gestational Age.

Hata et al (1988) in Japan did the first study on the ultrasonographic measurement of the fetal neck circumference and area correlated with gestational age. They used long, medium and short (LMS) chart marker lite program, version 2.3, by Cole and Pan as statistical tools. They found out that mean fetal neck circumference (FN-C), fetal neck area (FN-A), fetal neck anteroposterior diameter (FN-APD) and fetal neck transverse diameter (FN-TD) all correlated well with gestational age.

Garry et al (1992) in their work on neck circumference and area measurement in second trimester fetuses with Down's syndrome stated that the relationship between fetal neck circumference and area and gestational age is linear for normal fetus. David et al (2007) who conducted a similar study titled "Nomograms of fetal neck circumference and area throughout gestation" in New York using the cubic polynomial model (mean FNC (cm) = -11.85 + 1.687x GA (weeks) – 0.043 x GA^2 + 0.0004951 x GA^3), (Mean FNA (cm^2) =37.29 – 7.0 x GA + 0.4717 x GA^2 – 0.01245x GA^3x 0.0001222 x GA^4) found also that there is a linear correlation between the mean fetal neck circumference and area with gestational age.

2.4. Relationship between Fetal Neck Circumference and Area with other Biometric Parameters.

David et al (2007) found in their study that the fetal neck circumference and area correlated significantly and strongly with biparietal diameter, head circumference, abdominal circumference, humeral length, femur length, transcerebellar diameter and sonographically estimates gestational age. Garry et al (1992) noted in their work that the relationship between fetal neck circumference and area and other fetal biometric parameters (BPD, HC, AC and FL) were linear.

2.5. **Relationship between Fetal Neck Circumference and Area and Fetal Anomaly**.

Measurement of fetal neck circumference and area are useful in detecting some fetal abnormalities. Hamid-Sowinska et al (2011) in their work on congenital high air way obstruction syndrome noted that early diagnosis as from 26 weeks

of gestation using ultrasound can help in detailed fetal assessment and an adequate postnatal intervention for establishing fetal airways. Mong et al (2008) in their work “Congenital high airway obstruction syndrome: MRI/US findings, effect on management outcome” noted that MRI demonstrates large lung volumes, increased lung signal intensity, inverted diaphragm and dilated fluid filled lower airways, and usually identifies the obstruction level. They further stated that the degree of correlation between MRI and tertiary prenatal ultrasound is high although congenital high airway obstruction syndrome is frequently misdiagnosed on screening ultrasound scan. Liberty et al (2013) noted that fetal larynx and pharynx can be evaluated thoroughly using 2D-and 3D-ultrasound modalities. They further stated that knowledge of normal anatomy, function and biometry may prove useful in the evaluation of the anatomical or functional pathology involving the upper respiratory tract and that recognition of the anatomical anomalies may enhance fetal intervention such as balloon placement in cases of diaphragmatic hernia. Richard and Farah (1994) noted that laryngeal obstruction which is a life threatening condition can sometimes be diagnosed by prenatal ultrasound examination. They noted that dilation of the trachea is an important finding in this case and that the trachea increases from a mean of 2.4 mm at 18 weeks to 4.6 mm at 38 weeks of gestation. They concluded that early visualization of a dilated trachea may allow better management of fetus with laryngeal obstruction. Tez et al (2005) found that the diameter of the pharynx increases from 4.5 ± 0.53 mm at 16 weeks to 9.1 ± 1.72 mm at 36 weeks and suggests that 21-30 weeks of

gestational age might be the optimum time for evaluating the fetal pharynx for pathology. Cynthia and Anderson (2009) found out that using only nuchal translucency screening test, there is a detection rate of approximately 70-71% for Down's syndromes with a 3-3.5% false positive. Bahado et al (2005) also noted that increase in nuchal translucency greater than 3.5mm is associated with major congenital heart defect, defect of great vessels, fetal malformation, dysplasia, deformation, disruption and genetic syndromes. Comstock et al (2006) also noted that ultrasonography may be used for screening in the second trimester either alone or as an adjunct to maternal serum tests. They further added that markers of fetal chromosomal abnormalities such as facial cleft, micrognathia and atrioventricular septa defect may be detected by ultrasonography. Olson et al (2000) noted that nuchal fold thickness is affected by gestational age and fetal neck position and correction of these variables may improve the accuracy of the nuchal fold thickness measurement in screening of fetal chromosomal anomaly. David et al (2007) also noted that in addition to detecting subtle soft tissue changes in the upper posterior part of the neck used in detecting trisomy 21, fetal neck circumference and area can be used in detecting presence of nuchal cord(s).

Fetal neck circumference and area can be used as predictors of gestational age and also in detecting congenital anomalies of the neck. They also serve as pointers to other anomalies like heart defect, defect of great vessels, fetal malformation, deformation, dysplasia and genetic syndromes. Hence the need of nomograms of fetal neck circumference and area measurements in second and third trimesters in our locality.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

This is a prospective cross sectional study

3.2 Equipment

The equipment used in this study is Mindray DP-50 ultrasound machine with 3.5 MHz curved linear array transabdominal transducer, a product of Shenzhen Mindray Biomedical Electronics Co, Ltd China which was manufactured in 2012.

3.3 Duration of Study

This study was carried out for a period of fifteen months from September 2012 to November 2013,

3.4 Study Population

The population of this study comprises of all pregnant women with normal singleton gestation between 14-40 weeks of gestation referred to Braithwaite Memorial Specialist Hospital, Portharcourt within the period of the study. The age range was chosen in conformity with the trimesters being studied and also when the cervical bone which serves as a landmark for the measurements can be well demonstrated on scan.

3.5 Sampling Technique.

Convenience sampling method was used. This is because only the women who met the inclusion criteria in the study population within the time of the study were included in the study.

3.6 Sample Size

The $n = \frac{N}{1 + N(e)^2}$ (Yamane, 1973)

Where

n……sample size

N……population size

e……percentage error (percentage error at 95% level of confidence =0.05)

Using the total number of patients that were referred for obstetric scan in radiology department of Braithwaite Memorial Specialist Hospital (BMSH) Portharcourt between Dec 2011 and May 2012, a population of 1,360 patients was obtained and this gives a sample size of 390 patients. This number was increased to 723 in order to increase the sensitivity of the study.

3.7 Subject Selection Criteria

Inclusion Criteria

Subjects with the following under listed attributes were included in the study as there is no evidence of complication in their pregnancy

1. Known last menstrual period (LMP)
2. Viable singleton fetus.
3. Intact amniotic membrane.
4. No neck anomaly.
5. No previous history of adverse fetal outcome.
6. Patient not in labour.

7. No polyhdramnios or oligohydramnios
8. No growth retardation.

Exclusion Criteria.

Subject with the following under listed attributes were excluded from the studies because the following may have influence on the normal development of the neck.

1. Fetus with chromosomal anomaly.
2. Twin gestation.
3. Fetal growth retardation
4. Patient with poly- or oligohydramnios

3.8 Ethical Clearance/ Informed Consent.

Ethical clearance was obtained from Braithwaite Memorial Specialist Hospital ethical committee while informed consent was obtained from the subject before the study commences.

3.9 Scanning Technique

Transabdominal longitudinal scan was performed on the subject under the supervision of a consultant radiologist with more than ten years of experience. The patient lie supine on the couch with the abdomen barred and the coupling gel was applied to ensure good ultrasound wave transmission through the patient. Image of the fetal neck is obtained in neutral position in profile with the head and thoracic spines. The fetal neck circumference and area were measured during the transverse sonographic scanning of the fetal neck at an angle perpendicular to the cervical spine at mid point which corresponds to the level at which fetal neck appears largest with the aid of electronic caliper (David et al, 2007) as in figure 1 below.

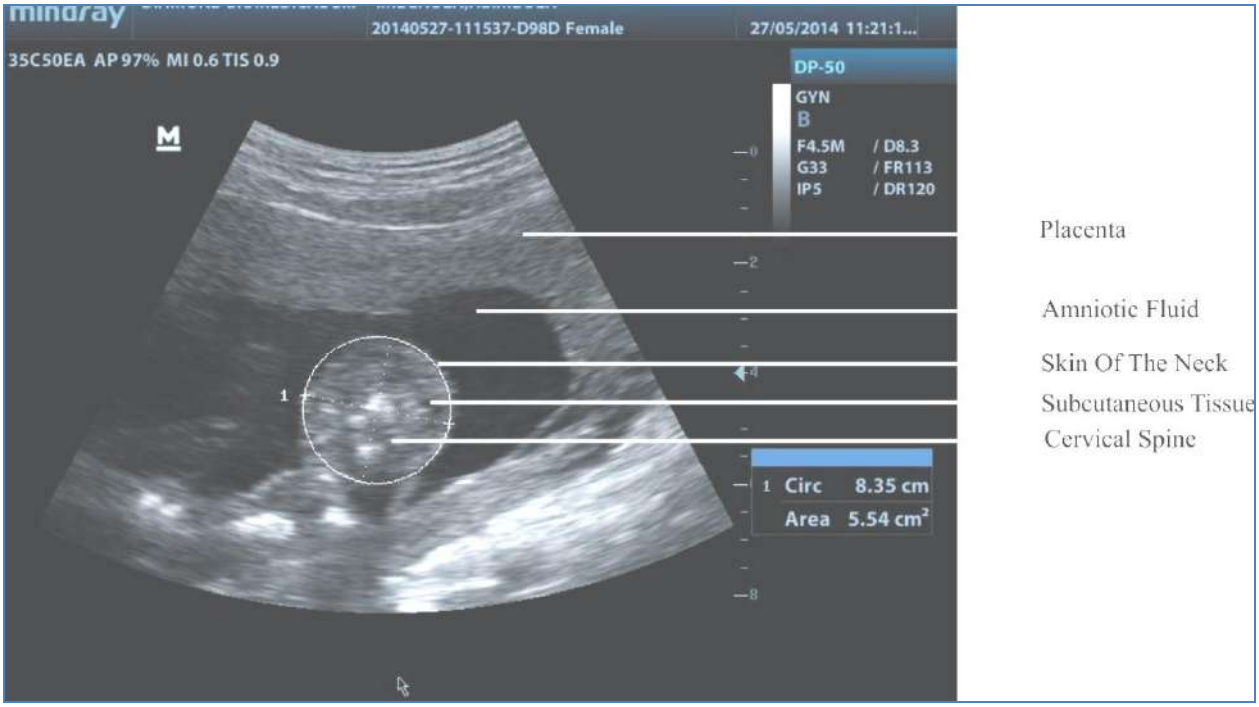


Figure 2. Diagram of fetal neck circumference and area measurement.

Transverse neck ultrasound of a 20 weeks old fetus. Note fetal spine which cast posterior shadows. The fetal skin and subcutaneous fat are also noted.

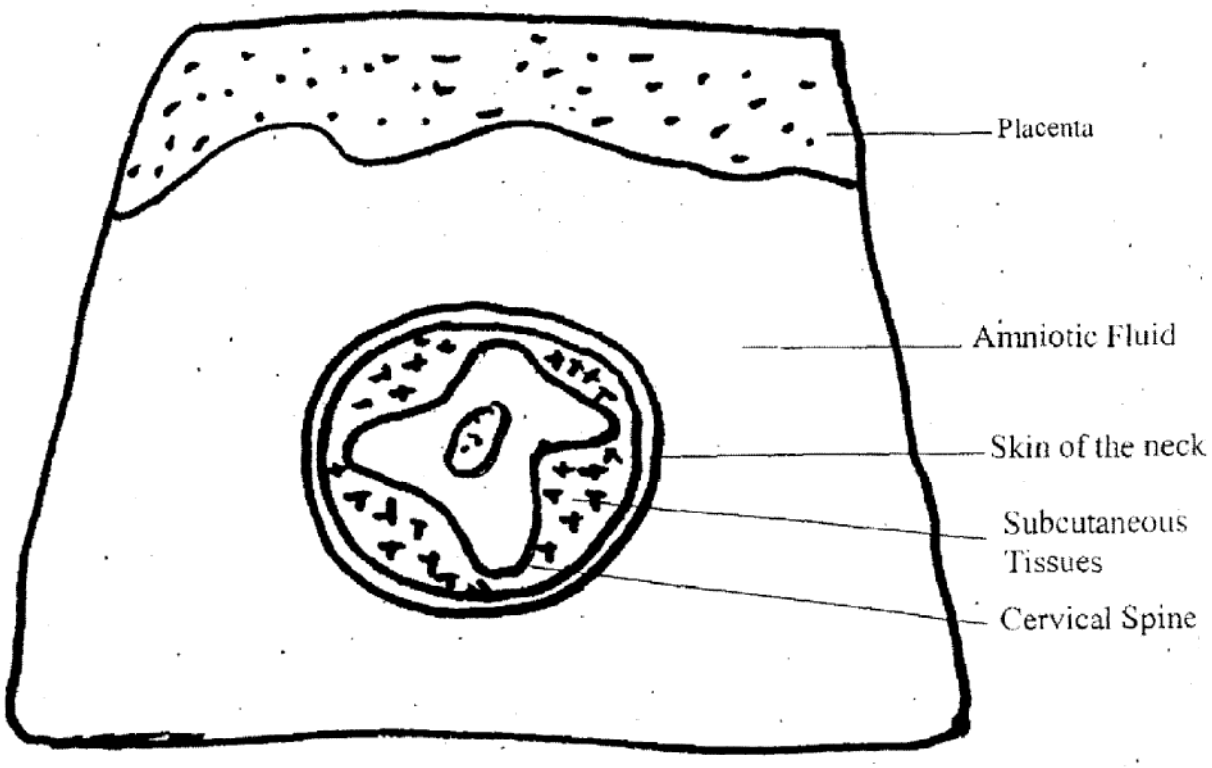


Figure2: Schematic Diagram of Fetal Neck Circumference and area measurements.

The biparietal diameter (BPD) is imaged in the transaxial plane of the fetal neck at the level of thalami in the midline, equidistance from the temporoparietal bone and usually the calvum septum pelucidium anteriorly. Measurement was then taken by placing a caliper on the outer edge of the proximal calvarium wall and on the inner edge of the distal calvarium wall (Saunders, 2000). Also the head circumference HC was measured on the same plane by placing a caliper on the outer edge of the calvarium and a computer generated ellipse was adjusted to fit round the head without including the scalp. The femur length (FL) was measured by placing the caliper from one end of the osseous portion of the femur of the other end disregarding bone curvature (Saunders, 2000). The abdominal circumference (AC) measurement was obtained by placing a caliper on the outer edge of the abdomen and using the inbuilt ellipse to adjust it to fit round the image of the abdomen in a plane slightly superior to the umbilicus at the level of the fetal liver, using the umbilical portion of the portal vein as the landmark.

3.10: Pilot Study:

The researcher and a senior sonographer conducted a pilot study to determine the reliability of fetal neck circumference and area measurements. When a patient who met the inclusion criteria fills the consent form after explaining the procedure to her, each of them scanned her and generates two measurements of fetal neck circumference and area. These procedures were done under the supervision of a consultant radiologist so as to reduce intra- and inter observer variations.

3.11 Statistical Analysis:

Data were analyzed using descriptive statistics and Microsoft ™ Statistical Software Package for Social Sciences (SPSS). Paired- Samples T Test was used to analyze the intra class correlation coefficient for observer variations. Mean, standard deviation and range were used in the generation of nomogram of fetal neck circumference and area. Linear regression analysis and Pearson correlation coefficient were used in establishing relationship between fetal neck circumference and area with other biometric parameters like FL, BPD, AC and HC. Independent- Samples T Test for equality of mean was used to check for statistical significant difference between the Caucasians and Nigerians.

CHAPTER FOUR

RESULTS

Table 1 shows high correlation coefficient values for both the intra and inter observer reliability which implies that both fetal neck circumference and area are reliable and reproducible within and between sonographers.

Table 1: Intra- and Inter rater reliability of Sonographic measurement of Fetal Neck

Circumference and Area.

Observer	**Intra- and Inter rater reliability**
Intra observer	Intra rater reliability
Sonographer 1	FNC = ICC (2,1) = 0.93
	FNA = ICC (2,1) = 0.90
Intra observer	Intra rater reliability
Sonographer 2	FNC = ICC(2,1) =0.86
	FNA = ICC(2,1) = 0.83
Inter observer	Inter rater reliability
Both sonographers	FNC = ICC (2,1) = 0.89
	FNA = ICC (2,1) = 0.85

Note: ICC = Intra Class Coefficient; ICC (2, 1) = Intra class correlation coefficient between the first and second measurement obtained by each sonographer (intra observer) and between the first measurements obtained by both sonographers (inter observer).

Table 2. Shows an increase in fetal neck circumference from 6.38cm at 14 weeks gestation to 14.34cm at 40 weeks gestation. Fetal neck circumference therefore increases with increase with gestational age.

Table 2. Distribution of fetal neck circumference according to gestational age obtained form maternal last menstrual period (LMP).

GA(wks)	N	MEAN FNC(cm)	SD	MIN (cm)	MAX (cm)
14	38	6.38	1.92	4.48	9.67
15	26	5.50	1.18	3.92	7.49
16	31	6.29	1.72	4.26	11.20
17	27	7.29	0.88	4.97	9.65
18	24	8.15	1.47	6.53	11.66
19	30	8.75	1.38	5.94	11.76
20	25	8.91	0.84	6.77	10.56
21	20	9.41	0.52	8.14	10.26
22	30	9.66	0.71	7.90	11.46
23	21	10.17	0.85	7.61	11.56
24	23	10.36	1.33	7.85	13.76
25	23	10.64	1.02	8.72	13.06
26	20	10.53	1.65	6.14	13.06
27	21	11.41	0.81	9.93	12.80
28	41	10.02	2.40	3.92	13.40
29	27	11.54	1.17	7.68	13.56
30	34	11.93	0.92	10.08	13.43
31	29	12.10	0.80	10.46	13.63
32	29	12.29	1.03	9.82	14.46
33	31	12.56	0.88	10.73	15.00
34	33	12.76	0.93	10.80	14.43
35	35	13.40	1.19	10.46	16.36
36	17	13.32	1.08	10.90	15.10
37	28	13.66	0.83	12.46	15.40
38	13	13.38	1.19	10.60	15.60
39	21	13.95	0.69	12.93	15.16
40	24	14.34	1.28	11.13	16.33

Table 3 shows that the mean fetal neck area increases from 3.63 ± 2.20 (cm^2) at 14 weeks gestation to 16.05 ± 2.77(cm^2) at 40 weeks gestation. Fetal neck area therefore increases with increase in gestational age.

Table 3: Distribution of fetal neck area according to gestational age obtained from maternal last menstrual period (LMP).

GA (wks)	N	MEAN FNA(cm^2)	SD	MIN (cm^2)	MAX (cm^2)
14	38	3.63	2.20	1.89	8.10
15	26	2.49	1.06	1.22	4.46
16	31	3.36	1.98	1.44	10.01
17	27	4.40	1.17	1.87	7.42
18	24	5.45	2.00	3.39	10.83
19	30	6.32	1.92	2.81	11.00
20	25	6.56	1.18	3.65	8.85
21	20	7.09	7.95	5.27	8.37
22	30	7.49	1.09	4.97	10.49
23	21	8.39	1.32	4.62	10.66
24	23	8.72	2.29	4.90	15.03
25	23	9.04	1.84	5.95	13.60
26	20	9.25	2.37	3.00	13.53
27	21	10.44	1.46	7.85	12.70
28	41	8.39	3.25	1.22	13.70
29	27	10.70	2.04	4.68	14.63
30	34	11.35	1.72	8.14	14.43
31	29	11.68	1.56	8.68	14.73
32	29	12.12	1.90	8.74	16.66
33	31	12.58	1.74	9.15	17.83
34	33	13.00	1.84	9.37	16.23
35	35	14.35	2.58	8.69	21.53
36	17	14.20	2.24	9.58	18.10
37	28	14.83	1.81	1.23	19.00
38	13	14.07	2.16	8.95	19.33
39	21	15.51	1.66	13.30	19.00
40	24	16.05	2.77	9.95	21.16

Table 4 shows the correlations between the fetal neck circumference and area with gestational age obtained from maternal last menstrual period and also with gestational age obtained from combined fetal biometric parameters. From the table, it can be deduced that there are strong correlation between fetal neck circumference and area with gestational age obtained from maternal last

menstrual period and that from combined fetal biometric parameters which includes femur length , biparietal diameter, abdominal circumference and head circumference. This is depicted by the high values of Pearson correlation coefficient which are 0.872 and 0.941 for fetal neck circumference and 0.879 and 0.938 for fetal neck area, it can also be noted that the fetal neck circumference and area correlates stronger with gestational age obtained from combined fetal biometric parameters than with gestational age obtained from maternal last menstrual period (LMP).

Table 4: Correlation of fetal neck circumference and area with gestational age obtained from maternal LMP and gestational age obtained from combined fetal parameters.

Correlation with GA by LMI	FNC	FNA
Pearson correlation coefficie	R = 0.872	R = 0.879
p-values	P < 0.01	P < 0.01
Number of measurements (	723	723
Correlation with GA obtaine From combined fetal parameters	FNC	FNA
Pearson's correlation coeffic	R = 0.941	R= 0.938
p-values	P < 0.01	P < 0.01
Number of measurements (	723	723

Note: FNC = Fetal neck circumference.

FNA = Fetal neck area.

GA = Gestational age

Table 5 shows that fetal neck circumference increases from 4.77 ± 0.34 cm at 14 weeks of gestation to 14.38 cm at 40 weeks of gestation. Fetal neck circumference therefore increases with increase in gestational age.

Table 5.Distribution of fetal neck circumference (FNC) according to gestational age obtained from combined FL, BPD, AC and HC parameters.

SECOND TRIMESTER (14-27 WKS)					
GESTATIONAL AGE (wks)	NO OF CASES	MEAN FNC (cm)	STANDARD DEVIATION	MINIMUM FNC (cm)	MAXIMUM FNC (cm)
14	29	4.77	0.34	3.40	5.36
15	25	4.95	0.73	3.92	6.23
16	20	5.90	0.43	5.17	6.81
17	24	6.88	0.31	5.95	7.46
18	29	7.15	0.59	5.65	9.12
19	27	7.96	0.81	6.16	9.26
20	23	8.55	0.74	7.01	9.90
21	23	8.92	0.60	7.81	10.23
22	22	9.59	0.82	7.06	10.56
23	26	9.84	0.64	8.73	11.50
24	22	10.00	0.69	8.40	11.30
25	28	10.29	0.70	9.06	11.83
26	21	10.51	0.68	9.47	11.66

27	24	10.94	0.83	9.28	12.06
TOTAL	343				
Overall mean fetal neck circumference = 8.30 ± 0.89cm					
THIRD TRIMESTER(28-40 WKS)					
28	41	11.00	0.73	9.82	12.93
29	28	11.16	0.86	9.23	12.90
30	22	11.61	0.57	10.44	12.43
31	31	11.81	0.86	10.08	13.43
32	32	12.49	0.85	10.30	14.06
33	41	12.56	0.83	10.80	14.33
34	37	12.86	0.89	10.90	15.00
35	24	13.15	0.92	11.03	15.10
36	22	13.25	0.69	12.10	14.46
37	35	13.44	1.19	11.63	16.46
38	21	13.72	1.07	12.06	16.33
39	24	13.87	1.19	12.40	15.60
40	22	14.38	0.76	13.50	15.83
TOTAL	380				
Overall mean fetal neck circumference =12.71 ± 0.87cm					

Table 6 show that mean fetal neck area increases from1.88 ± 0.26 cm^2 at 14 weeks gestation to 15.55cm^2 ± 1.68 cm^2 at 40 weeks of gestation. Fetal neck area therefore increases with increase in gestational age

Table 6: Distribution of fetal neck area (FNA) according to gestational age obtained from combined FL, BPD, AC and HC parameters.

SECOND TRIMESTER (14-27 weeks)					
GESTATIONAL AGE (WKS)	NO OF CASES	MEAN FNA (cm^2)	STANDARD DEVIATION	MINIMUM FNA(cm^2)	MAXIMUM FNA(cm^2)
14	29	1.88	0.26	0.92	2.28
15	25	1.97	0.57	1.22	3.08
16	20	2.77	0.40	2.12	3.68
17	24	3.68	0.28	2.83	4.43
18	29	4.40	0.83	2.53	6.61
19	27	5.04	0.88	3.08	6.85
20	23	6.10	1.16	3.92	7.86
21	23	6.38	0.85	4.86	8.30
22	22	7.41	1.16	3.97	8.85
23	26	7.69	1.04	6.08	10.60
24	22	8.08	1.13	5.63	10.19
25	28	8.44	1.19	6.53	11.10
26	21	9.03	1.14	7.14	10.83
27	24	9.61	1.50	6.86	11.66
TOTAL	343				

Overall mean fetal neck area =5.89 ± 0.88cm^2					
THIRD TRIMESTER (28-40 weeks)					
28	41	9.79	1.20	8.15	13.33
29	28	9.95	1.52	6.82	13.23
30	22	10.74	1.06	8.63	12.33
31	31	11.07	1.78	6.87	14.43
32	32	12.46	1.65	8.47	15.56
33	41	12.55	1.60	9.30	16.33
34	37	13.20	1.80	9.44	17.83
35	24	13.81	1.92	9.64	18.10
36	22	13.94	1.44	11.63	16.66
37	35	14.44	2.60	10.80	21.53
38	21	15.01	2.36	11.56	21.16
39	24	15.51	2.58	12.60	19.33
40	22	15.55	1.68	14.60	19.93
TOTAL	380				
Overall fetal neck area =12.92 ± 1.78cm^2					

Table 7 shows the relationship between fetal neck circumference and area with gestational age. These relationships can be predicted using these model equation: Gestational age (y) = 0.272 + 0.257 x FNC for fetal neck circumference and Gestational age (y) = 11.790 + 0.016 x FNA for fetal neck area.

Table 7: Relationship between fetal neck circumference (FNC) and fetal neck area (FNA) and gestational age with its predicted model equations.

Parameters	Fetal neck circumference(FNC)		Fetal neck area (FNA)	
	Value	Sig (p-value)	Value	Sig (p-value
R	0.941	0.000	0.938	0.000
R^2	0.885	0.000	0.880	0.000
F	5532.665	0.000	5310.541	0.000
CONSTANT	0.272	0.000	11.790	0.000
GA BY FP	0.257	0.000	0.016	0.000
MODEL EQUATION	y =0.272 + 0.257(FNC)		y = 11.790 + 0.016 (FNA	

NOTE: y = Gestational age.

F = F- statistics which is the ratio of regression mean square to residual mean square.

GA BY FP = Gestational age by combined fetal parameters (FL, BPD, AC and HC).

Figure 3 is a scatter diagram showing a linear relationship between fetal neck circumference and gestational age and can serve as a reference graph for determining the gestational age using fetal neck circumference.

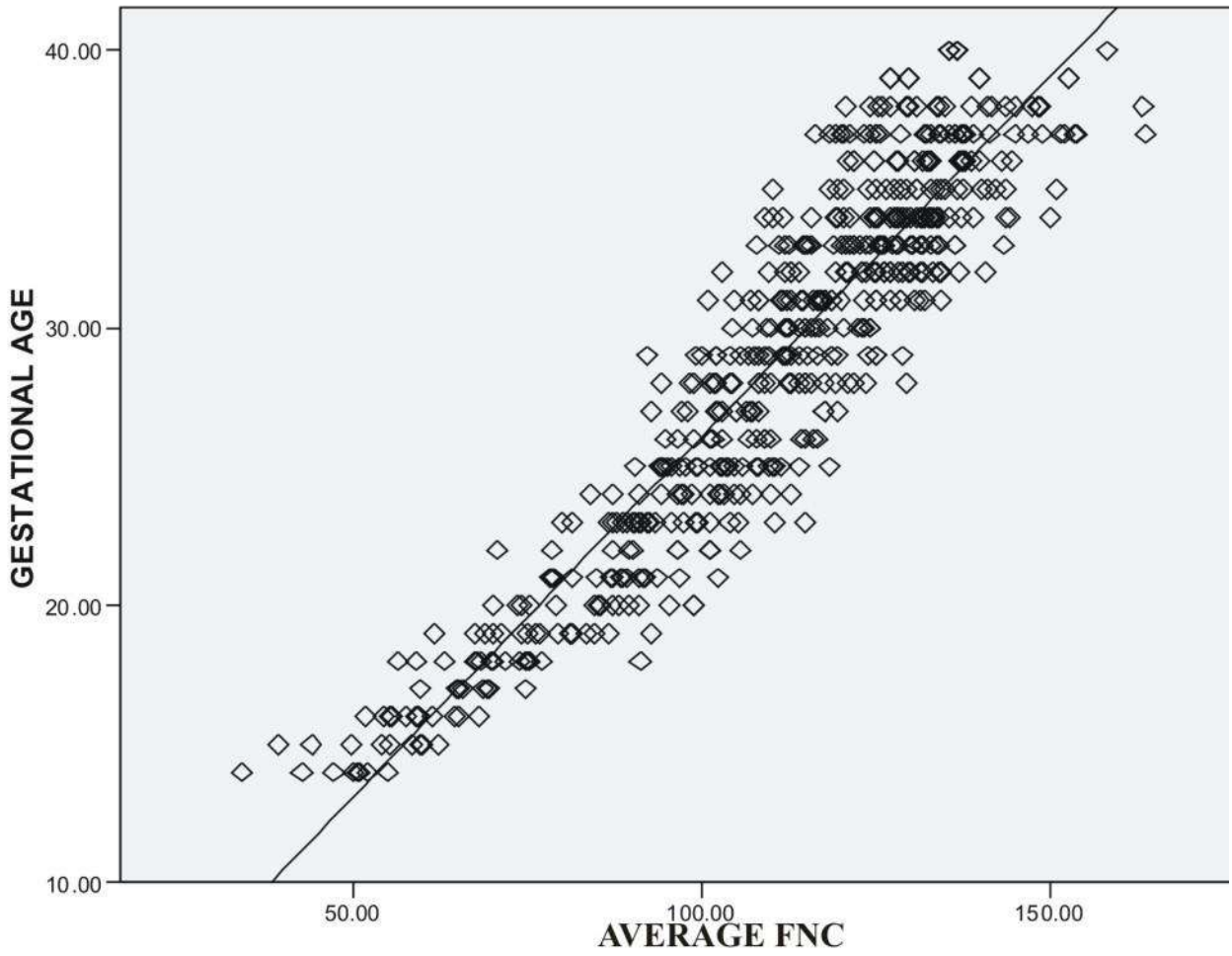


FIGURE 3: The relationship between fetal neck circumference and gestational age obtained from combined fetal biometric parameters.

Figure 4 is a histogram showing that fetal neck circumference data are normally distributed and that the predicted model fit well.

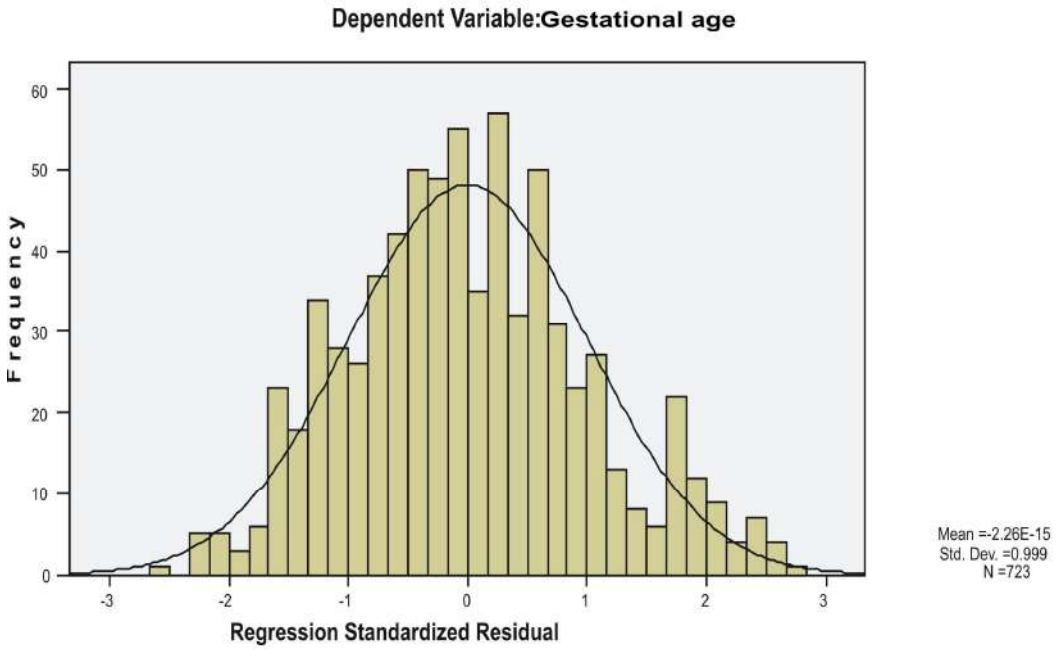


Figure 4: Fetal neck circumference in a normal distribution curve.

NOTE: Gestational age = Gestational age obtained from combined fetal parameters.

Figure 5 is a probability plot which shows that the data fits the predicted model equation well.

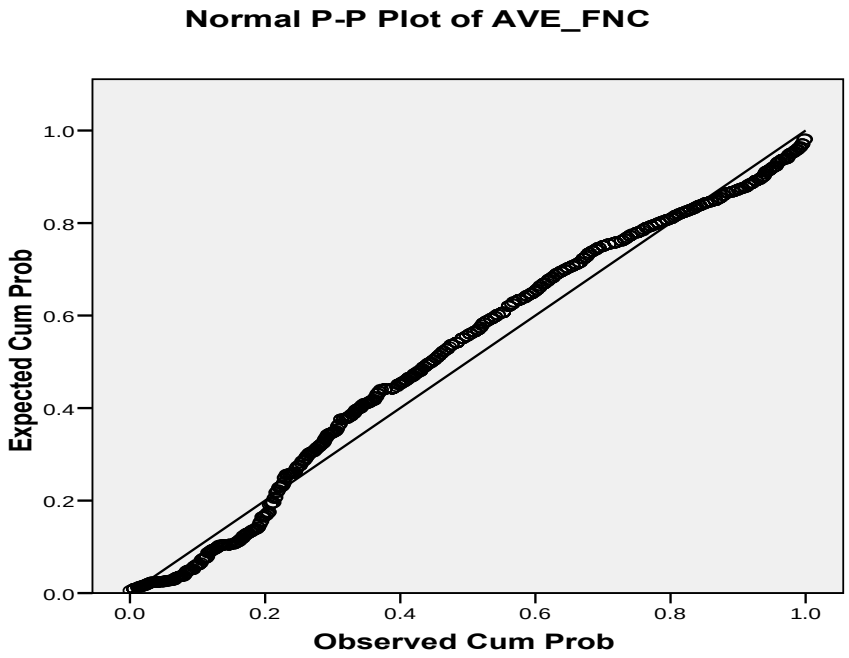


Figure 5: P-P Plot of fetal neck circumference.

Note: AVE_FNC = Average fetal neck circumference.

P-P PLOT = Probability – Probability plot.

Figure 6 is a scatter diagram showing that there is a linear relationship between fetal neck area and gestational age and can be used as a reference graph for determining the gestational age using fetal neck are.

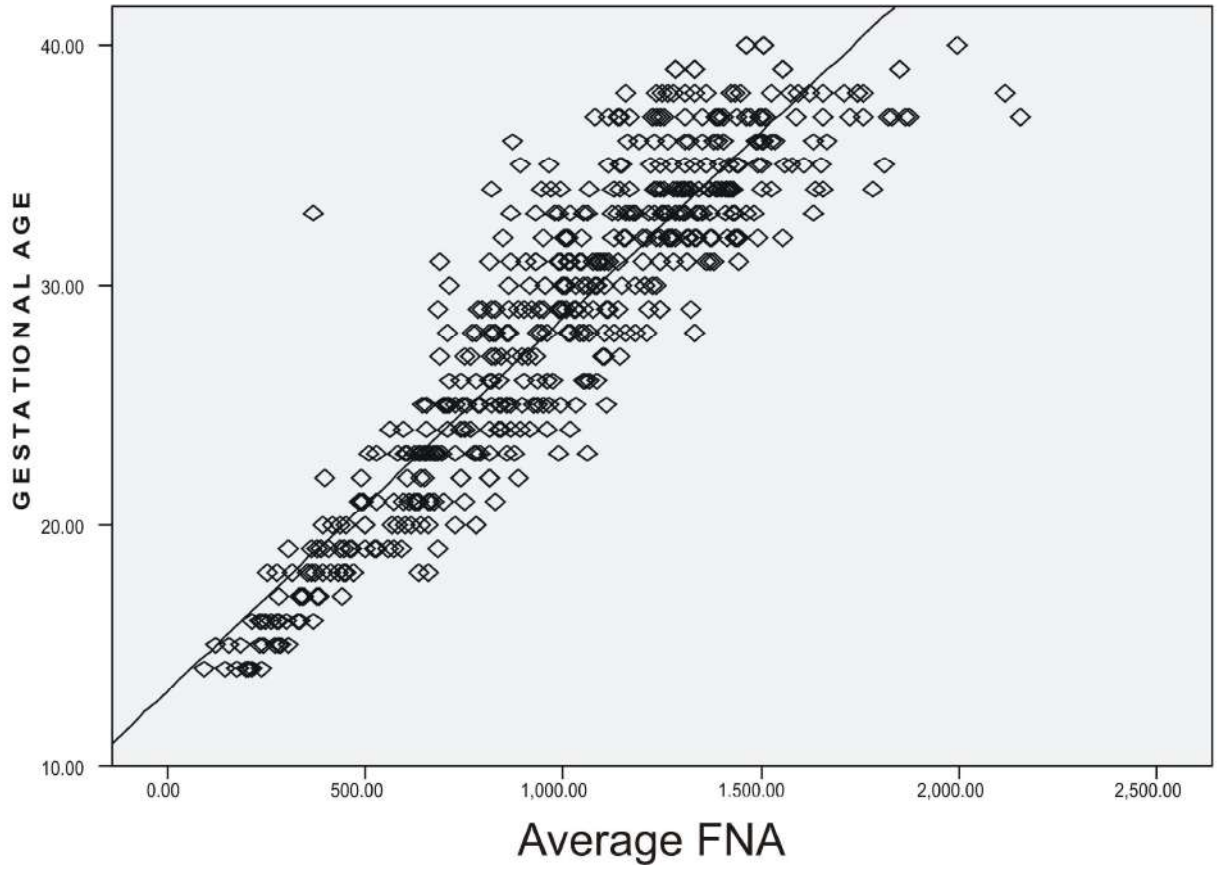
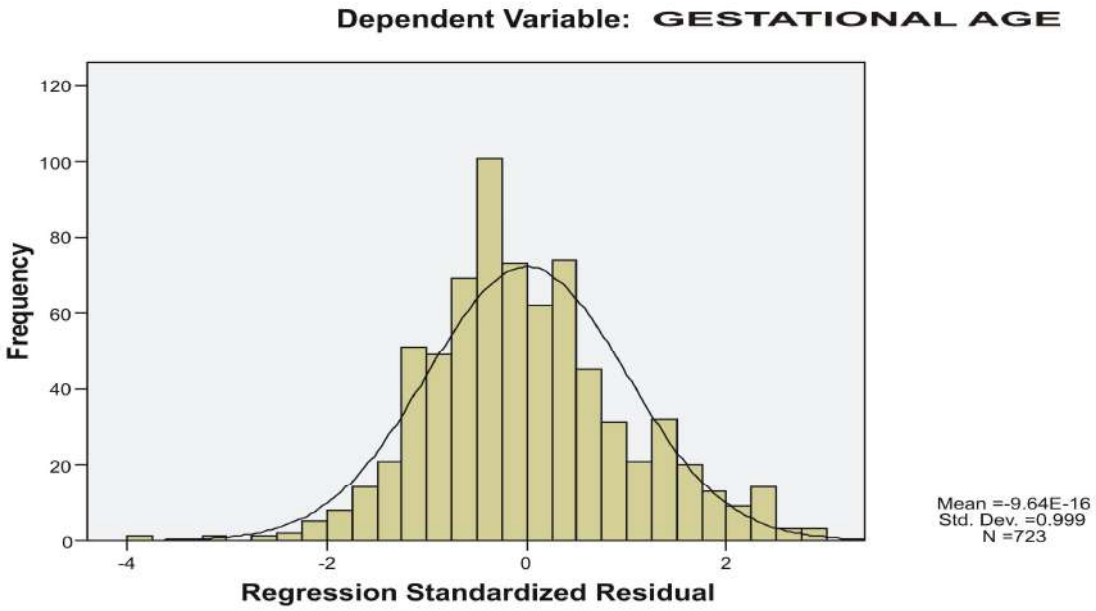


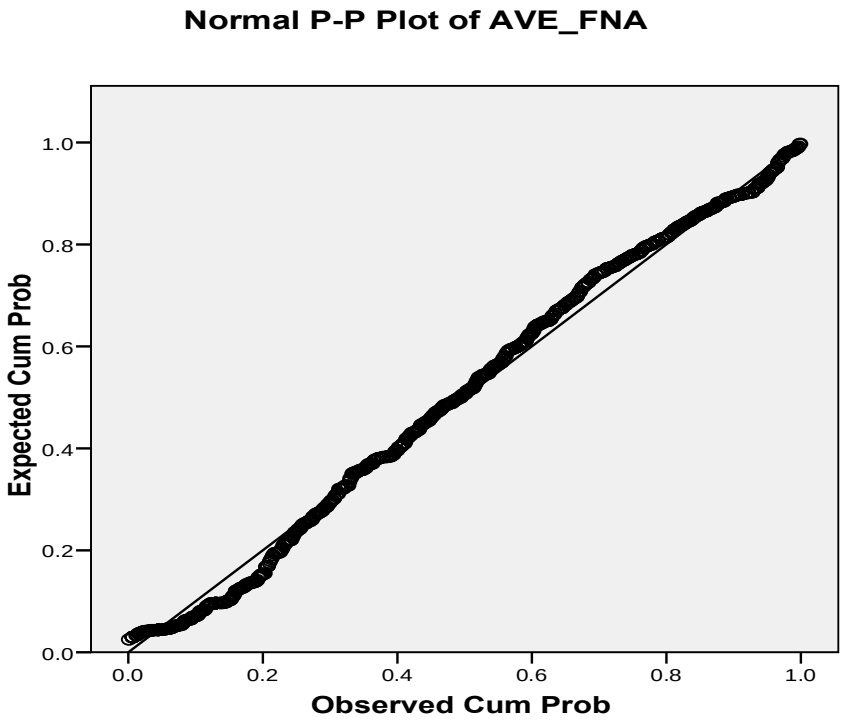
Figure 6. The relationship between fetal neck area and gestational age obtained from combined biometric parameters.

Figure 7 is a histogram showing that fetal neck area is normally distributed.



NOTE: Gestational age = Gestational age obtained from combined fetal parameters

Figure 8 is a P-P plot showing that the predicted model equation used fitted well.



Note: P-P Plot = Probability- Probability Plot.

AVE-FNA = Average fetal neck area.

Figure 8: P-P Plot of fetal neck area

Table 8 shows that there is high correlation between fetal neck circumferences with other biometric parameters like FL, BPD, AC and HC.

Table 8: Regression analysis showing the relationship between fetal neck circumference and FL, BPD, AC and HC.

Model		Value	Sig (p-value)	Model Equation
1	R	0.931	0.000	$y = a + b_1(X_1)$ FNC= 35714 +1.379(FL)
	Constant	35.714	0.000	
	FL(mm)	1.379	0.000	
2	R	0.947	0.000	$y = a + b_1(X_1) +b_2(X_2)$ FNC = 23.739 + 0.409(FL) + 0 (BPD)
	Constant	23.739	0.000	
	FL(mm)	0.409	0.000	
	BPD (mm)	0.914	0.000	
3	R	0.949	0.000	$y = a + b_1(X_1) + b_2(X_2) + b_3(X_3)$ FNC = 26.704 + 0.215(FL) +0. (BPD) + 0.157(AC)
	Constant	26.704	0.000	
	FL (mm)	0.215	0.000	
	BPD (mm)	0.475	0.011	
	AC(mm)	0.157	0.000	
4	R	0.954	0.000	$y = a + b_1(X_1) + b_2(X_2) +b_3(X_3) + b_4(X_4)$ y = 21.978 + 0.065(FL) + 0.021(BPD) + 0.064(AC) + 0.259(HC)
	Constant	21.978	0.000	
	FL (mm)	0.065	0.426	
	BPD (mm)	0.021	0.851	
	AC (mm)	0.064	0.021	
	HC (mm)	0.259	0.000	

Table 9 shows that there is high correlation between fetal neck area and other fetal biometric parameters like FL, BPD, AC and HC.

Table 9: Regression analysis showing the relationship between fetal neck area and FL, BPD AC and HC.

Model		Value	Sig (p-value)	Model Equation
1	R	0.921	0.000	$y = a + b_1(X_1)$
	Constant	-124.949	0.000	FNA= -124.949 +21.172 (FL)
	FL (mm)	21.172	0.000	
2	R	0.934	0.000	$y = a + b_1(X_1) + b_2(X_2)$
	Constant	-316.938	0.000	FNA = -316.938 + 5.623(FL) + 14.659(BPD)
	FL (mm)	5.623	0.000	
	BPD (mm)	14.659	0.000	
3	R	0.941	0.000	$y = a + b_1(X_1) + b_2(X_2) + b_3(X_3)$
	Constant	-238.973	0.000	FNA = -238.973 + 0.523(FL) +3. (BPD) + 4.121 (AC)
	FL (mm)	0.523	0.011	
	BPD (mm)	3.099	0.000	
	AC (mm)	4.121	0.000	
4	R	0.943	0.000	$y = a + b_1(X_1) + b_2(X_2) + b_3(X_3) + b_4(X_4)$
	Constant	-287.917	0.000	
	FL (mm)	-1.033	0.426	FNA = -287.917 -1.033(FL) -1.600(BPD) + 3.159(AC) + 2.687(HC)
	BPD (mm)	-1.600	0.851	
	AC (mm)	3.159	0.021	
	HC (mm)	2.687	0.000	

Note: a= Constant, X_1= FL, X_2=BPD, X_3=AC, X_4=HC

Table 10 shows that there is linear relationship between fetal neck circumference and area with other fetal biometric parameters. Also there is fetal neck circumference and area increases with increase in gestational age.

Table 10: Relationship between gestational age, FL, BPD, HC, AC and Fetal neck circumference and area.

GA(wks)	FL(mm)	BPD(mm)	HC(mm)	AC(mm)	FNC(cm)	FNA(cm^2)
14	14.4	25.6	93.7	72.9	4.77 ± 0.34	1.88 ± 0.26
15	16.6	29	109.6	86.9	4.95 ± 0.73	1.97 ± 0.57
16	21.7	33	120.4	101.7	5.90 ± 0.43	2.77 ± 0.40
17	24.3	37.6	141.8	109	6.88 ± 0.31	3.68 ± 0.28
18	26.9	41	152	124	7.15 ± 0.59	4.40 ± 0.83
19	29.7	44.7	168.9	135.6	7.96 ± 0.81	5.04 ± 0.88
20	32.3	47.8	179	147.8	8.55 ± 0.74	6.10 ± 1.16
21	35.3	50.7	194.5	159.8	8.92 ± 0.60	6.38 ± 0.85
22	38.0	54.4	197	169.9	9.59 ± 0.82	7.41 ± 1.16
23	40.8	56.8	212.5	182.1	9.84 ± 0.64	7.69 ± 1.04
24	43	60	226	194.8	10.00 ± 0.69	8.08 ± 1.13
25	45.9	63	232.8	204	10.29 ± 0.70	8.44 ± 1.19
26	47.9	64.9	243	214.4	10.51 ± 0.68	9.03 ± 1.14
27	49.9	67.6	252.6	235.7	10.94 ± 0.83	9.61 ± 1.50
28	53	70.9	258.8	241	11.00 ± 0.73	9.79 ± 1.20
29	55	73.6	269.6	246.6	11.16 ± 0.86	9.95 ± 1.52
30	58	76	278	257.5	11.61 ± 0.57	10.74 ± 1.0
31	60	78.4	283.3	269.2	11.81 ± 0.8	11.07 ± 1.7
32	61.8	80.8	293	280	12.49 ± 0.85	12.46 ± 1.6
33	62	82	299	289.5	12.56 ± 0.83	12.55 ± 1.6
34	65.9	85	308	302.5	12.86 ± 0.89	13.20 ± 1.8
35	67.9	87	315.8	310.3	13.15 ± 0.92	13.81 ± 1.9
36	70.7	89.6	324.8	320.5	13.25 ± 0.69	13.94 ± 1.4
37	73	91.9	330.6	329.5	13.44 ± 1.19	14.44 ± 2.6
38	75	92.7	336.4	339.6	13.72 ± 1.07	15.01 ± 2.3
39	77.4	96.4	348.5	351.2	13.87 ± 1.19	15.51 ± 2.5
40	79.4	98.4	349	359.6	14.38 ± 0.76	15.55 ± 1.6

Table 11 shows that there is no significant statistical difference between the fetal neck circumference values obtained from this study and the study done by David et al on Caucasians (USA) while there is significant statistical difference between the fetal neck area values obtained from this study and the study done by David et al on Caucasians.

Table 11: Comparison between the mean fetal neck circumference and area values obtained from the Caucasians (USA) and values obtained from this study.

			t test for equality of mean				
Work (FNC)	Mean	Standard deviation	t	Degree Of Freedom	Significanc	Mean Differenc	Standard er Difference
USA (N=720)	11.920	3.99041	1.595	46.424	0.117	1.49296	0.93591
Nigerian (N=723)	10.427	2.77973					
Work (FNA)	Mean	Standard Deviation	t	Degree Of Freedom	Significanc	Mean Differenc	Standard er Difference
USA (N=720)	12.6389	7.52688	2.019	41.126	0.050	3.36074	1.66487
Nigeria (N=723)	9.2778	4.26357					

CHAPTER FIVE

DISCUSSION AND CONCLUSION

5.1 Discussion.

5.11 Measurement of Fetal Neck Circumference and Area.

Ultrasound scanning is operator dependent and experience has influence in the accuracy of ultrasound measurement. According to Callen (2008), ultrasound accuracy depends greatly on the skill of the person performing the exam and the quality of the images, not to mention the size of the patient and the fetal position. This assertion was in agreement with Hadlock et al (1991). In this study, measurements of fetal neck circumference and area were done under the supervision of a consultant radiologist with more than 10 years of experience in obstetric scanning. Measurements of fetal neck circumference and area show high values of intra and inter rater reliability which implies that the fetal neck circumference and area can be objectively measured, reproducible and reliable. This is in keeping with the finding of Campbell (1993) which states that when choosing the optimal parameter for estimating gestational age, it is essential that the structure has little biological variation, and can be measured with a high degree of reproducibility.

Nomograms of Fetal Neck Circumference and Area Measurements.

Reference range tables for fetal neck circumference and area were generated using gestational age obtained from maternal LMP and gestational age obtained from combined fetal biometric parameters like FL, BPD, AC and

HC. Both tables show linear increase in fetal neck circumference and area with increase in gestational age. This is in conformity with the findings of David et al (2007), Garry et al (1991) and Hata et al (1988) which found a linear relationship between fetal neck circumference and area with increase in gestational age. So by implication, these parameters can serve as good predictor of gestational age. For FNC, the mean FNC at 40 weeks of gestation are 14.34 ± 1.28cm and 14.38 ± 0.76cm for gestation by maternal LMP and gestation by combined fetal biometric parameters respectively. Also mean FNA at 40 weeks is 16.05 ± 2.77cm^2 and 15.55 ± 1.68cm^2 for gestational age by maternal LMP and combined biometric parameters respectively.

These values are closely related with minimal differences, although for the purpose of this work, nomograms obtained using gestational age from combined fetal biometric parameters were adopted because it has stronger correlation than the one obtained from maternal LMP. So gestational age used subsequently refers to gestational age obtained from combined fetal biometric parameters like FL, BPD, AC and HC. When compared with the values obtained from combined fetal parameters on Caucasians (USA) which is 18.52 cm and 27.86 cm^2 for FNC and FNA respectively, we noticed high values for the Caucasians. These noticeable differences were subjected to test for significant using independent sample t- test which show no statistical significance difference between the two populations in FNC while there is statistical difference between the two population in FNA (p=0.05).

5.12: Fetal Neck Circumference (FNC).

Fetal neck circumference shows a linear increase with increase in the gestational age. It also shows strong correlation with other biometric parameters like femur length, biparietal diameter, abdominal circumference and head circumference which are regarded as gold standard for measuring gestational age. This implies that fetal neck circumference can be reliably used in the estimation of gestational age in the second and third trimesters. The mean fetal neck circumference values for second, third and combined trimesters measures 8.30 ± 0.89cm, 12.71± 0.87cm and 10.43 ± 2.77cm respectively. These values are close to the values obtained from the work done by David et al (2007) on Caucasians which were 8.72 ± 0.78cm, 15.36 ± 1.55cm and 11.92 ± 3.99cm respectively. These in all, show insignificant statistical difference in the fetal neck circumference measurement between the two studies. This is confirmed from t-test for equality of mean where the p-value of 0.117 ($p > 0.050$) was obtained which implies that there is no statistical significant difference between the two groups studied. The implication of this is that the difference noted in the studies by Hata et al (1985) and David et al (2007) could be attributed to difference in sonographic resolution of the ultrasound machine used now compared to that used in the last two decades ago.

5.13: Fetal Neck Area (FNA)

Fetal neck area shows linear increase with increase in the gestational age which is in keeping with the findings of David et al (2007), Garry et al (1991)

and Hata et al (1988). It also shows very strong statistical correlation with other biometric parameters like femur length, biparietal diameter, abdominal circumference and head circumference. So it can serve as a good predictor of gestational age.

In second, third and combined trimesters, mean fetal neck area measures 5.89 ± 0.88cm^2, 12.92 ± 1.78 cm^2 and 9.28 ± 4.26 cm^2 respectively while the mean fetal neck area in second, third and combined trimesters in the work done by David et al (2007) measures 6.59 ± 1.17cm^2, 19.14 3.78cm^2 and 12.63 ± 7.53 cm^2 respectively. At 40 weeks, the mean fetal neck area from this study measures 15.55cm^2 while the mean fetal neck area at 40 weeks from the study of David et al (2007) was 27.86cm^2. These values show wide difference which could imply significant statistical racial difference and when it is subjected to test for equality of mean, we found that the p- value is 0.05 which implies that there is significant statistical difference between the two groups. This shows that the difference noted in the studies by Hata et al (1985) and David et al (2007) could as well be attributed to difference in race and not the sonographic resolution of the ultrasound machine used now compared to that used in the last two decades.

5.14: Relationship between fetal neck circumference and area and gestational age obtained from patient's LMP

Pearson's correlation coefficient of 0.87 and 0.88 for fetal neck circumference and fetal neck area respectively were obtained using gestational age obtained from maternal LMP. This figures show evidence of positive significant relationships although when compared with that from gestational age obtained

from combined fetal biometric parameters, they show low positive significant relationship. The difference is more in the fetal neck circumference than in fetal neck area. This decrease could be attributed to irregularity in the menstrual cycle and variation in the ovulation date as noted by Walker et al (1988). Due to these differences in correlation coefficients, other statistical analyses were done using gestational age obtained from combined fetal biometric parameters. Also the choice of gestational age by combined fetal parameters was further enhanced by the fact that work on Caucasians (USA) in this topic used it and it therefore offers homogeneity in terms of comparing the works.

5.15: Relationship between fetal neck circumference and area and gestational age obtained from combined fetal parameters.

Pearson's correlation done using gestational age obtained from fetal biometric parameters (FL, BPD, AC and HC) gave correlation coefficients (R) of 0.941 and 0.938 for fetal neck circumference and fetal neck area respectively. These values show very strong positive statistical relationship but by way of comparison, fetal neck circumference show stronger statistical relationship than fetal neck area. Pearson regression analyses done using gestational age obtained from combined fetal parameters have large regression values which imply stronger relationship. The regression analyses therefore generated model equations for computing the fetal neck circumference ad fetal neck area as follows:

GA= 0.272 + 0.257 (FNC) with gestational age in weeks while FNC is in cm.

GA= 11.790 + 0.016 (FNA) with gestational age in weeks while FNA is in cm^2. Gestational age in weeks can therefore be obtained by inputting the values of FNC and FNA for each week in the appropriate equation.

In order to verify whether the models are appropriate for the data, histograms of fetal neck circumference and fetal neck area were plotted and both fit well with the shape of a normal distribution curve which signifies that models predicted by the regression analyses fits well. This in conformity with the high regression values which signifies that the model fits the data well and that fetal neck circumference and area explains the variation in the gestational age. Further assessment was carried out on the validity of the model by plotting the P-P plots for both fetal neck circumference and fetal neck area and the results shows that the line fit very close to the 45^0 line superimposed on it. The implication is that both models fit well and that the regression equations are valid.

5.16: Relationship between fetal neck circumference and area with fetal parameters (FL, BPD, AC and HC)

Relationship between fetal neck circumference and area with fetal parameters were tested using Pearson's correlation coefficient. For fetal neck circumference, values of 0.934, 0.947, 0.949 and 0.954 were obtained for FL, BPD, AC and HC respectively. These values indicate strong correlation. Pearson regression analysis was done to find the relationship between fetal neck circumference and fetal neck area with fetal parameters. It was found that both have high regression values showing strong relationship and that

the model fit very well. Regression model equations were generated for fetal neck circumference and fetal neck area as follows:

FNC (cm) = 21.978 + 0.065(FL) + 0.021 (BPD) + 0.064 (AC) + 0.259 (HC).

FNA (cm^2) = -287.917 + -1.033 (FL) + - 1.600 (BPD) + 3.159 (HC) + 2.687 (AC).

FL, BPD, HC and AC are all in millimeter (mm). These equations show that the relationship is linear. Reference range tables for fetal neck circumference and area with fetal parameters were generated.

5.2 Conclusion.

Normal ranges of fetal neck circumference and area measurements with reference to gestational age have not been documented for Blacks (Nigerian) to the best of the researcher's knowledge. This study therefore provides the nomograms of fetal neck circumference and area measurement in the second and third trimesters for Blacks. There is statistical significant difference between Blacks (Nigerian) and the Caucasians (USA) in fetal neck area measurement while no statistical difference was noted in the fetal neck circumference measurement between the studied populations. Data presented in this study can be used objectively to rule out or confirm fetal anomaly which results in the decrease or increase in the fetal neck circumference and area in-utero for quick intervention.

5.3 Recommendations.

1. Fetal neck circumference and area measurements should be routinely done to assess fetal growth and well being.

2. Fetal neck anomaly which result in increase or decrease in fetal neck size will be routinely ruled out by measuring the fetal neck circumference and area.
3. Tables and graphs from this study should be used as indigenous charts for estimating gestational age in second and third trimesters.

5.4 Limitations of the study.

1. Some fetus in antero-posterior position with flexed neck poses difficulty in getting an accurate fetal neck measurement as most of them give measurements less than the normal range.
2. Effect of maternal age and parity was not recorded in this study.

5.5. Area of further research.

1. Effects of fetal sex and maternal age and parity on fetal neck circumference and area measurements.

REFERENCES

Alfred B Kurtz (2000). Estimating gestational age. In: Benson and Carol editions: *Ultrasound, A Practical approach to clinical problems.* New York Thieme medical publisher. Pg.305-10.

Anderson C.L and Brown C.E.L (2009). Fetal chromosomal abnormalities: Antenatal Screening and Diagnosis. *American Family Physician; 79 (2):117-123.*

Bahado-singh RO, Wapner R, Thom E, Zachary J, Platt L, Mahoney MJ, Johnson A, Silver RK, Pergament E, Filkins K, Hogge WA, Wilson RD, Jackson LG (2005). Elevated first trimester nuchal translucency increases the risk of congenital heart defect. *American Journal of Obstetrics and Gynecology; 192 (5): 1357-61.*

Benson CB, Doubilet PM (1991). Sonographic prediction of gestational age: Accuracy of Second-and third- trimester fetal measurement. *American Journal of Roentgenology;157 (6):1275-7.*

Callen PW (2008). The obstetrics ultrasound examination. In: Callen PW editors. *Ultrasound in Obstetrics and gynecology.* 5th edition. Philadelphia: Saunder Elsevier. Pg. 3-25.

Campbell S. (1993). Gestational age determination: Second trimester, In: Chervenac FA, Isaacson GS, Campbell S, edition. *Ultrasound in Obstetrics and Gynecology.* Boston: Little, Brown and Company. Pg. 305-10.

Chaudhuri K, Su LL, Wong PC, Chan YH, Choolani MA, Chia D, Biswas A. (2013). Determination of gestational age in twin pregnancies- which crown rump length should beused? *Journal of obstetrics and gynecology Research; 39 (4): 761-5.*

Comstock C, Malone FA, Ball RH, Nyberg DA, Saade GR, Berkowltz RL, Ferreira J. Dugoff L,

Craigo SD, Timor- Tritsch IE, Carr SR, Wolfe HM, Blanch DW, D'Alton ME. (2006). For the faster research consortium: Is there a nuchal translucency millimeter measurement above which there is no added

benefit to first trimester screening? *American Journal of Obstetrics and Gynecology;* 195 (3):845-847.

David M Sherer, Margarita Sokolovski, Mudar Dalloul, Emil Dib, John C. Pezzullo, Joseph A. Osho, Ovadia Abulafia (2007). Nomograms of Fetal Neck Circumference and Area throughout Gestation. *Journal of Ultrasound Medicine;* 26: 1529-1537.

Degan S (2001). Fetal Biometry: Clinical, Pathological and Technical Considerations. *Obstetrics and Gynecology Survey*; 56 (3): 159-67.

Fill, RA, Hadlock FP: Sonographic determination of menstrual age, in Callen PW, ed. *Ultrasound journal of obstetrics and gynecology,* Philadelphia: Saunders, 2000:146-70.

Gardosi j, Frances A (1999): Controlled trial of fundal height measurement plotted on customized antenatal growth chart. *British journal of Obstetrics and Gynecology*; 106:309-317.

Garry W Turner, Anthony W Vintzileos, Deborah A Nardi, Lori Feeny, Winston A Campbell, John F Rodis (1991). Neck Circumference measurement in 2nd trimester fetuses with Down's syndrome. *Journal of Maternal-Fetal and Neonatal Medicine*; 1(2): 65-69.

Geirsson RT, Busby-Earle RM.(1991). Certain date may not provide a reliable estimate of gestational age. *British journal of obstetrics and gynecology: 98(1);108-9.*

Geirsson RT, Busby-Earle RM.(1991). Certain date may not provide a reliable estimate of gestational age. *British journal of obstetrics and gynecology: 98(1);108-9.*

Gervasio A, Dorta G, Mujaheed I, Biswas A. (2011). Sonographic anatomy of the neck. *Journal of ultrasound; 14(3):130-135.*

Gottlieb AG, Galan HL (2008). Nontraditional sonographic pearls in estimating gestational age. *Semin Perinatol*; 32(2): 154-60.

Hadlock FP, Deter RL, Harrist RB, Park SK. (1984). Establishing fetal age: Computer-assisted analysis in multiple fetal growth parameters. *Radiology; 152(2): 497-501.*

Hata K, Hata T, Takamiya O, Kitao M (1988). Ultrasonographic measurement of fetal neck circumference correlated with gestational age. *Journal of Ultrasound Medicine*; 7: 333-337.

Janelle Durham (2002). Calculating Due Date and the Impact of Mistaken Estimates of Gestational Age; *For Certification with Birth Education* NW.

Johnsen SL, Rasmussen S, Sollien R, Kiserud TK (2005). Fetal age assessment based on femur length at 10-25 weeks of gestation and reference range for femur length and head circumference ratio. *Act Obstetrics and Gynecology Scand*; 84(8): 725-33.

Johnsen SL, Wilsgaard T, Rasmussen S, Sollien R, Kiserud T (2006). Longitudinal reference charts for growth of the fetal head, abdomen and femur. *European Journal Obstetrics and Gynecology Reproductive Biology*; 27(2): 172-85.

Johnston MC. (1990). Embryology of the head and neck. In. McCarthy JG, ed. Plastic surgery. 4th edition. Philadelphia, Pa. WB Saunders; Pg. 2451-95.

Kalish RB, Chervenak FA(2002): Ultrasound assessment of gestational age. *Optimal Obstetrics*; 1:1-6.

Kalish RB, Thaler HT, Chasen ST, Gupta M, Berman SJ, Rosenwak Z, Chervenak FA. (2004) First- and second trimester ultrasound assessment of gestational age. *American Obstetrics& Gynecology*; 191:975-8.

Liberty G, Boldes R, Shen O, Shaul C, Cohen SM, Yagel S. (2013). Fetal larynx and pharynx: Structure and development on two- and three- dimensional ultrasound. *Ultrasound of Obstetrics and gynecology;* 42(2): 140-8.

Mong A, Johnson AM, Kramer SS, Coleman BG, Hedrick HL, Kreiger P, Flake A,Wilson RD, Adzick NS, Jaramilo D. (2008). Congenital high airway

obstruction syndrome: MRI/US Findings, effect on management and outcome. *Radiology;* 38(11): 1171-9.

Mongeli M, Yuxin NG, Biswas A, Chew S. (2003). Accuracy of ultrasound dating formulae in the late second-trimester in pregnancies conceived with in-vitro fertilization. *Acta Radiologica;* 44(4):452-5.

Mittendorf R, Williams MA, Berkey CS, Cotter PF. (1990). The length of uncomplicated human gestation *Journal of Obstetrics and Gynecology*; 7(6): 929-932.

Olson G, Saade GR, Zlatnik M, Dildy GA, Belfort M. (2000). The effect of fetal neck position on the nuchal fold thickness. *American journal of obstetrics and gynecology*; 183(4): 995-7.

Pang MW, Leung TN, Sahota DS, Lau TK, Chang AM (2003). Customizing fetal biometric charts. *Ultrasound of Obstetrics Gynecology*; 22(3): 271-6.

Peek MJ, Devonald KJ, Belby R, Beilby R, Ellwood D. (1994). The value of routine early Pregnancy ultrasound in antenatal booking clinic. *Australia and New Zealand Journal of Obstetrics and Gynaecology;* 34(2):140-3.

Richard DS, Farah LA. (1994). Sonographic visualization of the fetal upper airways. *Ultrasound of Obstetrics and Gynaecology;* 4(1):21-3.

Simic M, Wâhlin IA, Marsál K,Källén K. (2010) Source of error in mid trimester ultrasound Estimation of gestational age. *Ultrasound of Obstetrics and Gynaecology; 35(1):48-53.*

Synnove LJ, Svein Rasmussen, Rita Sollien, Torvid Kiserud. (2004). Fetal age factors. assessment based on ultrasound head biometry and the effect of maternal and fetal. *Acta Obstetrics and Gynecology Scand*; 83(8): 716-23.

Tez S, Köktener A, Askoy FG, Turhan NO, Dilmen G. (2005). Ultrasound evaluation of normal Fetal pharynx. *Early Human Development; 81(7): 629-33.*

Walker, Lewis M, Cooper W (1988). Occult biochemical pregnancy: Fact or Fiction. *British Journal of Obstetrics and Gynecology*; 95: 659-63.

Wilcox M, Gardosi J, Mongeli M, Ray C, Johnson I. (1993). Birth weight from pregnancies dated by ultrasonography in multicultural British population. *British Medical Journal; 307 (6904): 588-91.*

Wu FS, Hwu YM, Lee RK, Li SH, Sun FJ, Lin MH, Lin SY (2012). First-trimester ultrasound estimation of gestational age in pregnancies conceived after an in vitro fertilization. *European Journal of Obstetrics and Gynecology Reproduction Biology*; 160 (2): 151-5.

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13th February, 2014.

HOSPITAL ETHICAL COMMITTEE

Abonyi, Everistus Obinna
Department of Radiology
University of Nigeria
Enugu Campus

ETHICAL APPROVAL

Research proposal tittle "Sonographic Correlation of Fetal Neck Circumference and Area with Gestational age in Port Harcourt Nigeria."

We refer to your letter dated 20th April 2013 requesting for Ethical approval of your research project tittle "Sonographic Correlation of Fetal Neck Circumference and Area with Gestational age in Port Harcourt Nigeria"
After a critical appraisal of your proposal by the Braithwaite Memorial Specialist Hospital Ethical committee and Research and Training, Approval is hereby given to you to commence your study.

Note the following:

1. The study can only be started after it is approved by the examining body.
2. The Hospital reserves the right to withdraw this approval if at any time during the conduct of the study you infringe on the ethical regulations of the hospital or the ethical right of your study subject.

RIVERS STATE HOSPITALS MANAGEMENT BOARD
Braithwaite Memorial Specialist Hospital
P.M.B. 5064,
Port Harcourt

DR. AARON, F.N.
Secretary
For Chairman
Ethical Committee

APPENDIX 11

CONSENT FORM

SONOGRAPHIC CORRELATION OF FETAL NECK CIRCUMFERENCE AND AREA WITH GESTATIONAL AGE IN PORTHARCOURT, NIGERIA.

1. **INTRODUCTION**

   You have been selected to participate in a study on this topic: sonographic correlation of fetal neck circumference and area with gestational age in Portharcourt, Nigeria.
   The information contained in this study will be of immense benefit to pregnant mothers as it will help in determining their gestational age especially in the second and third trimester where it has been found that other biometric parameters are suboptimal.
   Also, pregnant mothers participating in this study will benefit so much as the study will identify any abnormalities associated with the neck of their fetus so as to receive urgent and better treatment.

2. **PARTICIPATION.**

   Participation in this study is completely voluntary. Even though you have been selected, you are at liberty to accept or reject the offer.

3. **STUDY PROCEDURE/RISK.**

   Upon acceptance to participate, the participant will be interviewed and then scanned using an ultrasound machine. The scanning has been extensively documented to be of no risk to either the mother or the fetus.

4. **COST IMPLICATION.**

   No additional cost is made for participating in this study. The money paid already for your normal scan has covered everything.

5. **CONFIDENTIALITY**

   All information gathered will be treated with utmost confidentiality. The identity of the participant will not be required.

6. **FEEDBACKS.**

   The researcher can be contacted at the radiology department of Braithwaite Memorial Specialist Hospital (BMSH) Portharcourt, Rivers State.

7. **RESPONSE.**

   I have read the above (or somebody has read and explained the study to me). I understood the nature and benefits of the study and hereby give my consent to participate.

Date:é é é é é é é é é é .. é é é é é é é é é

Signature of participant

THANK YOU.

APPENDIX 111

RAW DATA

NOTE:

LMP: Last menstrual period.

GA-BY-LMP: Gestational age by last menstrual period.

FNC1 (mm): First measurement of fetal neck circumference in millimeter.

FNC2 (mm): Second measurement of fetal neck circumference in millimeter.

FNC 3(mm): Third measurement of fetal neck circumference in millimeter.

AVE FNC (mm): Average fetal neck circumference measurement in millimeter.

FNA 1(mm^2): First measurement of fetal neck area in millimeter square.

FNA 2 (mm^2): Second measurement of fetal neck area in millimeter square.

FNA 3 (mm^2): Third measurement of fetal neck area in millimeter square.

AVE-FNA (mm^2): Average fetal neck area in millimeter square.

FL (mm): Femur length in millimeter.

FL (wks): Femur length in weeks.

BPD (mm): Biparietal diameter in millimeter.

BPD (wks): Biparietal diameter in weeks.

AC (mm): Abdominal circumference in millimeter.

AC (wks): Abdominal circumference in weeks.

HC (mm): Head circumference in millimeter.

HC (wks): Head circumference in weeks.

FP-GA (wks): Gestational age by combined fetal biometric parameters.

APPENDIX III

RAW DATA

NO	DATE OF SCAN	LMP	GA BY LMP	FNC1 (mm)	FNC2 (mm)	FNC3 (mm)	AVE FNC (mm)	FNA1 (mm)	FNA2 (mm)	FNA3 (mm)	AVE FNA	FL (mm)	FL (Wks)	BPD (mm)	BPD (Wks)	AC (mm)	AC (WKs)	HC(mm)	HC(wks)	FP GA Wks
1	18/09/12	17-04-12	32	96.8	100	98	98.266667	900	803	920	874.33333	54.1	29	70.9	28	242	29	258	28	28
2	'	22-02-12	29	136	127	129	130.66667	1360	1290	1310	1320	70.8	36	88	35	332	37	333	38	36
3	'	3/5/2012	19	90.8	91	90	90.6	656	659	645	653.33333	45.8	25	62	25	214	25	231	25	25
4	'	17-04-12	21	96.4	100	101	99.133333	742	803	805	783.33333	54.5	29	71.1	28	252	29	279	30	29
5	'	19-03-12	25	122	121	123	122	1180	1170	1200	1183.3333	64.4	33	86.5	34	288	33	306	34	33
6	'	5/5/2012	18	98.7	94.1	90.8	94.533333	775	705	655	711.66667	47.9	26	61.9	25	201	25	239	26	25
7	'	18-02-12	29	127	127	119	124.33333	1280	1280	1120	1226.6667	73.8	37	90.5	36	345	38	350	38	37
8	'	20-06-12	14	88.4	88.3	84.7	87.133333	618	620	571	603	31.9	20	51	21	159	21	174	20	20
9	,,	12/6/2012	16	52.3	43.2	54.6	50.033333	217	148	237	200.66667	18	14	25	14	79.7	14	94.3	14	14
10	'	11/5/2012	18	103	98.7	96.7	99.466667	844	776	744	788	46.6	25	60.8	24	206	25	241	26	25
11	'	28-03-12	24	140	137	136	137.66667	1560	1480	1470	1503.3333	71.2	36	87	35	316	36	323	36	36
12	'	15-07-12	9	53.6	50	51.6	51.733333	227	199	212	212.66667	20.4	16	34.2	16	109	17	129	16	16
13	'	22-03-12	25	111	113	112	112	957	1010	1000	989	64	33	83	33	286	33	303	33	33
14	22-09-12	10/5/2012	18	97.2	106	104	102.4	731	891	858	826.66667	31.9	27	70.8	28	258	27	266	29	27
15	'	25-05-12	16	90	97	98	95	654	655	657	655.33333	46.5	25	60.8	24	217	26	228	24	25
16	'	17-05-12	17	94	96.8	98.9	96.566667	703	746	778	742.33333	48.9	26	63.7	25	211	26	246	26	26
17	'	1/3/2012	28	136	136	130	134	1360	1360	1330	1350	75.7	38	92.3	37	323	36	339	37	37
18	'	10/6/2012	14	98.8	90.8	100.5	96.7	800	790	840	810	42.7	24	55.6	23	180	23	203	22	23
19	'	7/3/2012	27	136	124	124	128	1360	1220	1220	1266.6667	71.2	36	89.1	36	323	36	322	36	36
20	,,	19/5/12	18	72.6	68.3	70.7	70.533333	430	520	455	468.33333	27	18	40	18	125	18	144	18	18
21	,,	12/5/2012	19	75.9	80.2	86.7	80.933333	548	560	600	569.33333	29	19	45	19	144	19	160	19	19
22	'	25-07-12	8	58.9	60.8	59.7	59.8	276	294	283	284.33333	17.9	15	33.6	16	104	16	125	16	15
23	'	19-07-12	9	66.6	70.8	70.3	69.233333	353	399	393	381.66667	24.1	17	38.8	17	126	18	143	17	17
24	'	26-05-12	16	96.4	92	93.9	94.1	742	674	701	705.66667	45	25	64	25	188	24	240	26	25
25	,,	16/6/12	16	52.3	43.2	54.6	50.033333	217	148	237	200.66667	18	14	25	14	79.7	14	94.3	14	14
26	'	1/4/2012	24	126	129	123	126	1260	1330	1200	1263.3333	62.4	32	83.4	33	289	33	303	33	33
27	'	1/4/2012	24	120	122	118	120	1140	1180	1100	1140	65.1	34	51.6	33	287	33	304	33	33
28	'	12/2/2012	31	130	130	134	131.33333	1340	1340	1420	1366.6667	66.3	34	80.3	34	302	34	283	34	34
29	,,	21/4/12	22	96.6	97	98.5	97.366667	775	795	790	786.66667	40.2	22	53	22	180	22	198	22	22

30	'	6/12/2012	37	135	142	140	139	1420	1560	1550	1510	74.4	38	92.3	37	330	37	332	38	37
31	,,	10/6/2012	16	52.3	43.2	54.6	50.033333	217	148	237	200.66667	18	14	25	14	79.7	14	94.3	14	14
32	'	25/2/12	30	109	113	114	112	950	1010	1030	996.66667	60.5	30	74.3	29	264	31	287	31	30
33	24-09-12	2/1/2012	33	110	107	105	107.33333	959	916	872	915.66667	57.9	30	75.7	30	272	31	276	30	30
34	'	16-02-12	31	118	124	120	120.66667	1110	1220	1140	1156.6667	64.7	33	84.6	32	291	33	304	33	33
35	..	22-04-12	21	92.5	96.8	93.9	94.4	651	739	701	697	46.1	25	62.2	25	206	25	229	25	25
36	,,	19/3/12	27	125	106	117	116	1146	1100	1090	1112	51.6	27	68	27	223	27	260	28	27
37	'	19-04-12	22	90.8	91.4	94.1	92.1	656	665	704	675	39.8	23	56.2	23	185	23	212	23	23
38	'	3/6/2012	28	52	54	51.3	52.433333	220	215	210	215	15	15	31.5	16	89.6	15	111	15	15
39	'	18-03-12	26	116	117	112	115	1070	1090	1000	1053.3333	53.8	28	72.3	28	237	28	260	28	28
40	'	9/1/2012	36	131	139	135	135	1370	1530	1450	1450	76.3	38	93.4	38	340	38	330	37	38
41	'	22-01-12	34	124	129	130	127.66667	1220	1330	1330	1293.3333	67.1	35	88.4	35	318	36	314	35	35
42	'	17-01-12	35	167	161	163	163.66667	2220	2070	2170	2153.3333	72.3	37	91.5	36	327	37	330	37	37
43	'	20-01-12	35	122	120	119	120.33333	1180	1130	1120	1143.3333	73.6	37	89.2	36	331	37	330	37	37
44	..	5/2/2012	32	106	109	101	105.33333	888	934	805	875.66667	43.4	24	59.9	24	182	23	255	24	23
45	'	17-01-12	35	131	136	122	129.66667	1370	1360	1190	1306.6667	76.2	38	93.9	38	342	38	332	38	38
46	26-09-12	6/2/2012	33	133	135	133	133.66667	1410	1420	1410	1413.3333	67.7	35	84.7	34	310	35	314	35	34
47	'	5/4/2012	24	97.5	92.9	106	98.8	757	687	900	781.33333	50.3	27	66.7	27	208	25	232	25	26
48	'	18-04-12	22	95.6	97	109	100.53333	790	820	810	806.66667	41.3	23	58.1	23	197	24	221	24	23
49	'	13-02-12	32	131	122	120	124.33333	1370	1180	1140	1230	64	33	83.2	33	282	32	305	34	33
50	,,	30/5/12	17	73.3	69.4	70.1	70.933333	433	521	430	461.33333	27.3	18	42	18	126	18	146	18	18
51	'	9/3/2012	28	107	109	114	110	895	934	1030	953	60.2	31	75.9	30	279	30	276	30	30
52	'	9/2/2012	32	129	121	129	126.33333	1320	1170	1310	1266.6667	65.4	34	82.2	33	297	34	305	34	33
53	'	2/3/2012	29	114	113	116	114.33333	1040	1010	1080	1043.3333	59.1	31	76.5	30	274	31	300	33	31
54	'	25-02-12	30	101	107	94.6	100.86667	817	916	710	814.33333	59.5	31	78.1	31	274	31	279	30	31
55	..	13-02-12	31	105	111	123	113	869	972	1200	1013.6667	63.2	33	76.3	30	282	32	299	32	32
56	'	7/3/2012	28	104	106	99.2	103.06667	868	891	783	847.33333	62.8	32	80.8	32	283	32	304	33	32
57	,,	20/6/12	16	52.3	43.2	54.6	50.033333	217	148	237	200.66667	18	14	25	14	79.7	14	94.3	14	14
58	'	21/12/11	39	139	140	135	138	1490	1480	1480	1483.3333	79	40	99	41	361	40	356	41	40
59	'	28-05-12	17	67.5	70.4	72.6	70.166667	364	394	420	392.66667	32.4	20	46.8	20	159	21	182	20	20
60	'	27-03-12	25	100	110	109	106.33333	900	930	1000	943.33333	56.8	29	68.4	27	249	29	263	28	28
61	'	12/7/2012	10	34.3	36	31.9	34.066667	93.4	103	80.9	92.433333	10.7	14	23.3	14	69.4	14	89.3	14	14
62	..	12/5/2012	19	77.3	73.9	84.3	78.5	476	434	565	491.66667	40.3	23	49.5	20	181	23	197	21	22

63	'	6/3/2012	16	115	105	116	112	1040	883	1080	1001	64.2	33	77.6	31	277	32	301	33	32
64	'	6/6/2012	15	68.5	67.8	73.9	70.066667	369	366	435	390	32.4	20	44.9	19	143	20	173	19	19
65	28/09/12	3/2/2012	33	123	123	118	121.33333	1190	1200	1110	1166.6667	72.8	37	92.2	37	334	37	332	38	37
66	'	14/2/12	32	125	120	116	120.33333	1240	1130	1080	1150	68.4	35	89.4	36	314	35	319	35	35
67	'	1/3/2012	29	112	104	111	109	999	859	976	944.66667	64.6	33	89.4	36	284	33	306	34	34
68	'	2/2/2012	34	113	120	116	116.33333	1030	1130	1080	1080	73.3	37	89.6	37	324	37	328	37	37
69	'	1/7/2012	12	60.1	58.6	58.6	59.1	287	272	274	277.66667	18.7	16	38.8	17	102	16	136	17	16
70	'	12/5/2012	19	98	98	110	102	800	800	800	800	40.2	23	55.8	23	184	23	216	23	23
71	'	15-02-12	19	113	109	111	111	1030	934	976	980	64	33	83	33	285	33	294	32	33
72	29-09-12	15/3/12	27	118	120	120	119.33333	1110	1130	1140	1126.6667	63	32	79.5	32	274	31	296	32	32
73	,,	21/9/12	35	156	151	151	152.66667	1940	1810	1800	1850	77.3	39	92.2	37	360	40	349	40	39
74		24/2/12	35	130	130	129	129.66667	1340	1340	1310	1330	77.9	39	96.3	39	357	40	335	38	39
75	,,	24/3/12	27	120	121	121	120.66667	1160	1170	1170	1166.6667	54.2	29	69.2	27	244	27	256	27	27
76	'	21-05-12	18	71.7	71.4	68.7	70.6	409	406	376	397	39.6	23	52.9	22	175	22	202	22	22
77	'	20-03-12	27	106	121	122	116.33333	888	1170	1190	1082.6667	58.2	30	77.2	30	273	31	287	31	30
78	'	20/05/12	18	75.4	86.3	74.9	78.866667	452	593	447	497.33333	37.7	22	49.8	21	162	22	185	22	21
79	'	14/4/12	23	95.5	89.4	93.7	92.866667	725	636	699	686.66667	50.8	27	70.7	28	220	26	265	28	27
80	'	16/6/12	28	39.2	38.4	40.2	39.266667	122	120	126	122.66667	15	15	31.5	16	89.6	15	111	15	15
81	'	27/3/12	26	115	119	112	115.33333	1040	1120	1000	1053.3333	57.8	30	74	29	239	28	271	29	29
82	,,	2/6/2012	17	70.6	69.6	70.7	70.3	432	519	455	468.66667	26.8	18	40.7	18	136	19	150	18	18
83	'	7/2/2012	33	127	126	122	125	1280	1240	1190	1236.6667	73.6	37	86.9	35	331	37	332	38	37
84	'	19-4-12	22	106	97.2	103	102.06667	888	752	848	829.33333	53.5	28	67.8	27	230	27	252	27	27
85	'	7/4/2012	24	96.3	95.2	85.5	92.333333	738	729	581	682.66667	55.3	29	79.3	31	252	29	265	28	29
86	1/10/2012	21-04-12	22	89.8	93.9	89.1	90.933333	638	698	631	655.66667	42.9	24	62.2	25	183	23	238	25	24
87	,,	2/7/2012	13	45	44	42.8	43.933333	170	146	180	165.33333	17	14	26	14	79.2	14	95.3	14	14
88	'	21/2/12	31	125	129	127	127	1240	1330	1280	1283.3333	64.2	33	80.7	32	281	32	300	33	32
89	,,	18/6/12	16	55.1	53.8	56.6	55.166667	235	230	255	240	20	16	33.1	16	123	16	104	16	16
90	'	15/2/12	32	125	130	130	128.33333	1240	1340	1330	1303.3333	68.1	35	81.4	32	298	34	313	35	34
91	,,	25/6/12	16	43.8	43.2	42.7	43.233333	146	148	146	146.66667	18	14	25	14	79.7	14	94.3	14	14
92	'	10/2/2012	33	110	113	108	110.33333	959	1010	925	964.66667	69.1	35	86.8	35	312	35	321	36	35
93	'	21/2/12	31	117	114	115	115.33333	1090	1040	1060	1063.3333	64.3	33	83.1	33	291	33	311	34	33
94	'	26/2/12	30	125	124	125	124.66667	1240	1220	1250	1236.6667	63.7	33	80.3	32	292	33	300	33	32
95	'	27/06/12	13	52	51.2	50.9	51.366667	203	200	220	207.66667	14.5	14	29.4	15	95.6	16	109	15	15

96	'	12/2/2012	32	122	123	119	121.33333	1180	1210	1120	1170	68.2	35	81.9	33	313	35	317	35	34
97	'	18/6/12	28	50.7	52	54	52.233333	209	210	215	211.33333	15	15	31.5	16	89.6	15	111	15	15
98	,,	10/4/2012	38	137	136	134	135.66667	1490	1480	1420	1463.3333	72.7	37	90.5	36	324	37	328	37	40
99	,,	4/6/2012	17	69	72.3	64.9	68.733333	379	416	335	376.66667	24.8	17	37.9	17	127	18	137	17	17
100	'	11/6/2012	15	54.7	61.6	60.6	58.966667	238	302	292	277.33333	27.9	18	42.4	18	124	18	150	18	18
101	,,	25/6/12	14	43.7	45	45.8	44.833333	200	178	189	189	18	14	29	15	80.1	14	96.4	14	14
102	'	21/2/12	31	122	128	118	122.66667	1180	1310	1100	1196.6667	65.7	34	82.6	33	275	32	303	33	33
103	,,	25/6/12	16	52.3	43.2	54.6	50.033333	217	148	237	200.66667	18	14	25	14	79.7	14	94.3	14	14
104	'	1/4/2012	25	89.8	93.9	89.1	90.933333	638	698	631	655.66667	42.9	24	62.2	25	183	23	190	23	23
105	2/10/2012	12/2/2012	32	129	126	128	127.66667	1320	1240	1300	1286.6667	67.6	35	85.3	34	303	34	318	35	34
106	'	7/2/2012	33	127	124	123	124.66667	1280	1220	1200	1233.3333	72.4	37	90	36	325	36	328	37	36
107	'	1/4/2012	25	110	109	109	109.33333	920	900	980	933.33333	54.9	29	69.7	28	239	28	265	28	28
108	'	2/2/2012	34	121	120	122	121	1170	1130	1190	1163.3333	70.4	36	85.6	36	324	37	322	36	36
109	'	6/6/2012	30	130	135	132	132.33333	1300	1290	1290	1293.3333	66.4	34	83.7	33	301	34	301	33	33
110	,,	22/5/12	19	80.3	76.8	90	82.366667	550	540	546	545.33333	30.4	19	46	19	158	19	169	19	19
111	'	22/2/12	31	111	112	108	110.33333	957	1020	925	967.33333	66	34	82.3	33	307	35	298	35	34
112	'	25/4/12	22	77.9	87.2	87.1	84.066667	483	604	604	563.66667	43.7	24	58.3	23	200	25	224	24	24
113	3/10/2012	3/3/2012	30	116	116	112	114.66667	1070	1070	1000	1046.6667	61.4	32	76.3	30	281	32	295	32	31
114	,,	27/6/12	16	52.3	43.2	54.6	50.033333	217	148	237	200.66667	18	14	25	14	79.7	14	94.3	14	14
115	,,	30/5/12	19	75.3	70.7	67.5	71.166667	440	500	465	468.33333	28.1	18	40.2	18	128	18	147	18	18
116	'	14/6/12	15	53.7	58.6	57.4	56.566667	229	272	262	254.33333	25.7	18	37.7	17	119	18	182	20	18
117	'	22/1/12	36	130	133	130	131	1340	1410	1330	1360	74.2	38	86.7	38	338	38	333	38	38
118	'	20/6/12	28	54	49.8	52.6	52.133333	220	215	213	216	15	15	31.5	16	89.6	15	111	15	15
119	'	1/2/2012	34	125	123	127	125	1240	1210	1280	1243.3333	74.1	38	86.2	38	335	37	333	38	37
120	,,	28/3/12	27	120	121	121	120.66667	1160	1170	1170	1166.6667	54.2	29	69.2	27	244	27	256	27	27
121	'	7/5/2012	21	87	86	88.9	87.3	602	589	629	606.66667	41.5	23	53.3	22	170	22	208	22	22
122	,,	9/5/2012	21	100	95.7	98.6	98.1	790	790	770	783.33333	41.2	23	54	22	180	22	200	22	22
123	'	22/2/12	31	117	107	111	111.66667	1090	916	976	994	65	34	85	35	301	34	308	34	34
124	10/10/2012	10/1/2012	38	116	121	121	119.33333	1070	1170	1170	1136.6667	74.6	38	92.6	37	339	38	339	37	37
125	..	14/1/12	38	127	128	123	126	1280	1310	1200	1263.3333	76.7	39	94.7	38	344	38	333	38	38
126	,,	13/6/12	17	69	71.8	65	68.6	378	419	337	378	24.8	17	37.9	17	127	18	137	17	17
127	'	6/2/2012	34	120	123	118	120.33333	1140	1210	1100	1150	68.1	35	86.4	34	290	33	318	35	34
128	..	7/7/2012	13	48.9	47.6	45.3	47.266667	190	180	164	178	13.1	14	28	15	83.6	15	93	15	14

129	'	23/3/12	28	100	110	120	110	900	891	850	880.33333	54	29	68	27	237	28	258	28	28
130	,,	4/7/2012	16	46	43.2	42.8	44	170	148	201	173	18	14	25	14	79.7	14	94.3	14	14
131	'	14/3/12	29	96.7	108	102	102.23333	744	924	822	830	59.2	31	74	29	244	29	267	29	29
132	'	6/2/2012	34	116	121	118	118.33333	1070	1170	1100	1113.3333	67.9	35	86.8	35	309	35	314	35	35
133	'	25/2/12	32	115	110	112	112.33333	1040	1000	1000	1013.3333	62	32	80.1	32	274	31	285	32	31
134	'	21/2/12	31	110	115	114	113	959	1040	1030	1009.6667	63.2	33	82.1	33	269	31	302	33	32
135	'	20/6/12	15	56.3	58	58.6	57.633333	252	267	274	264.33333	21.9	16	34	16	95.2	16	122	16	16
136	,,	8/2/2012	35	156	155	155	155.33333	1930	1900	1750	1860	77.3	39	93	37	362	40	368	40	39
137	'	19/2/12	32	119	120	125	121.33333	1130	1130	1250	1170	65.9	34	79.7	32	287	33	307	34	33
138	'	4/7/2012	28	96	106	102	101.33333	990	900	900	930	54	29	68	27	237	28	258	28	28
139	'	12/1/2012	38	123	125	122	123.33333	1190	1300	1190	1226.6667	74.2	38	90.6	36	343	38	339	37	37
140	,,	4/1/2012	40	139	140	141	140	1575	1600	1530	1568.3333	78	40	97	39	354	39	356	39	39
141	'	1/3/2012	31	105	108	101	104.66667	869	924	811	868	62.2	32	78.6	31	259	30	281	31	31
142	10/10/2012	1/6/2012	18	65.2	70.7	69.2	68.366667	339	398	382	373	27.3	18	41.9	18	125	18	158	18	18
143	'	19/4/12	24	91.8	99.9	99.1	96.933333	671	794	781	`748.66667	47.7	26	61.9	25	198	24	227	24	25
144	'	7/1/2012	39	132	129	127	129.33333	1380	1330	1280	1330	74.1	38	94	38	339	38	350	38	38
145	,,	18/7/12	13	47.8	51.1	50.7	49.866667	209	153	233	198.33333	16.3	14	25.8	14	82.5	14	96.4	14	14
146	'	1/5/2012	22	87.6	98.6	84.1	90.1	611	773	562	648.66667	40	23	51	21	179	23	206	22	22
147	'	12/1/2012	38	120	128	128	125.33333	1140	1310	1300	1250	75.2	38	97.7	38	339	38	338	38	38
148	..	22/1/12	37	133	128	135	132	1410	1310	1450	1390	72.4	37	92.6	37	326	37	335	38	37
149	'	25/2/12	22	112	117	115	114.66667	999	1090	1060	1049.6667	65	34	82.3	33	294	33	307	34	33
150	'	19/2/12	32	113	118	107	112.66667	1030	1100	919	1016.3333	65.4	34	84.3	33	295	33	307	34	33
151	,,	25/3/12	28	106	110	101	105.66667	900	891	890	893.66667	52.7	28	67.5	27	242	29	267	29	28
152	12/10/2012	23/3/12	28	108	114	112	111.33333	923	1040	100	687.66667	62.6	32	75.4	30	268	31	280	30	31
153	'	11/5/2012	21	93.2	102	102	99.066667	691	821	822	778	44.4	24	54.6	22	198	24	212	23	23
154	'	6/7/2012	28	103	106	110	106.33333	990	1000	900	963.33333	54	29	68	27	237	28	258	28	28
155	'	7/7/2012	13	113	108	104	108.33333	1030	924	858	937.33333	55.4	29	72.9	29	233	28	259	28	28
156	'	15/2/12	33	114	123	129	122	1040	1230	1310	1193.3333	70.9	36	89.6	37	332	37	318	35	36
157	'	11/3/2012	30	122	120	124	122	1180	1130	1220	1176.6667	66.5	34	80.3	34	292	33	294	32	33
158	'	29/6/12	28	50.2	50.2	51.6	50.666667	230	209	225	221.33333	15	15	31.5	16	89.6	15	111	15	15
159	'	7/4/2012	26	113	108	104	108.33333	1000	924	1000	974.66667	55.4	29	72.7	29	233	28	266	29	28
160	,,	6/7/2012	14	50	49.6	51.1	50.233333	210	145.7	239	198.23333	16.9	14	26.9	14	77.9	14	96.5	14	14
161	'	16/6/12	16	64.9	72.7	76.3	71.3	335	420	463	406	29.9	19	44.7	19	145	20	164	19	19

162	,,	6/7/2012	16	52.3	43.2	54.6	50.033333	217	148	237	200.66667	18	14	25	14	79.7	14	94.3	14	14
163	,,	15/6/12	17	70	70.7	70.2	70.3	376	418	339	377.66667	25	17	38	17	125.8	18	138	17	17
164	'	15/2/12	33	114	123	129	122	1040	1230	1310	1193.3333	70.9	36	89.6	37	332	37	325	36	36
165	'	1/4/2012	27	109	108	108	108.33333	950	924	925	933	60.7	31	80.6	32	265	31	262	31	31
166	'	3/3/2012	31	126	127	128	127	1260	1280	1300	1280	68.6	35	85	35	286	33	314	35	34
167	'	22/6/12	15	58.1	64	62.8	61.633333	268	344	313	308.33333	29.6	19	46.3	19	152	20	168	19	19
168	'	1/4/2012	27	109	108	108	108.33333	950	924	925	933	60.7	31	80.6	32	256	30	283	31	31
169	15/10/12	7/7/2012	14	63.5	63	68	64.833333	321	316	370	335.66667	25.1	17	40.5	18	116	17	147	17	17
170	'	1/4/2012	27	108	108	105	107	923	924	872	906.33333	61.4	32	77.2	30	265	31	287	31	31
171	'	8/2/2012	35	125	127	129	127	1240	1280	1310	1276.6667	74.1	38	93.3	37	327	37	344	39	38
172	'	7/5/2012	22	94.7	95.6	97.1	95.8	714	722	750	728.66667	44.6	25	65.9	26	201	25	236	25	25
173	'	16/2/12	34	130	125	118	124.33333	1340	1300	1100	1246.6667	74	37	90.8	36	345	38	344	39	37
174	'	23/7/12	28	96	106	102	101.33333	734	891	822	815.66667	54	29	68	27	237	28	258	28	28
175	,,	1/6/2012	18	73	73	70.9	72.3	430	516	465	470.33333	27.4	18	41.7	18	129	18	150	19	18
176	'	22/3/12	29	112	105	111	109.33333	999	883	976	952.66667	57.4	30	79.8	32	249	29	292	32	30
177	'	3/5/2012	23	97.2	105	111	104.4	731	883	976	863.33333	57.4	30	79.8	32	249	29	292	32	30
178	'	7/8/2012	9	49.9	55.5	46.9	50.766667	198	245	175	206	9.71	13	25.7	14	68.8	14	70.3	14	14
179	'	1/7/2012	14	74	68.1	68	70.033333	436	369	370	391.66667	26.3	18	40.6	18	128	18	152	18	18
180	'	10/5/2012	22	102	93.6	97.5	97.7	821	697	757	758.33333	46.5	25	64.1	25	217	26	229	25	25
181	'	19/3/12	29	109	105	110	108	950	883	957	930	64.6	33	80.8	32	300	34	300	33	33
182	'	27/5/12	19	100	105	105	103.33333	890	883	900	891	45.2	25	63.8	25	199	25	231	25	28
183	22-10-12	19/7/12	13	56.5	62.8	59.4	59.566667	254	314	281	283	24.9	17	39.8	18	123	18	150	18	17
184	'	17/6/12	17	86.7	86.2	88.4	87.1	598	586	608	597.33333	39	22	51.2	21	168	22	181	22	21
185	'	11/8/2012	10	54	63.4	61.7	59.7	232	320	303	285	15.2	14	33.7	16	91.8	15	111	15	15
186	'	26/7/12	12	54.3	52.9	56.3	54.5	233	223	252	236	19	16	36.3	17	94	16	128	16	16
187	'	8/6/2012	18	102	100	109	103.66667	799	780	790	789.66667	41.3	23	60.5	24	168	22	221	24	23
188	'	29/4/12	24	115	116	119	116.66667	1040	1070	1120	1076.6667	54.8	29	74.3	29	248	29	273	29	29
189	'	23/2/12	33	122	121	119	120.66667	1180	1170	1120	1156.6667	75.5	38	94.3	38	338	38	341	39	38
190	,,	21/5/12	22	96.7	100	102	99.566667	790	790	780	786.66667	40	22	52	22	184	22	197	22	22
191	,,	7/5/2012	24	99.7	100	103	100.9	866	870	870	868.66667	43.9	24	59.8	24	196	24	220	24	24
192	'	30/7/12	28	96	106	102	101.33333	734	891	822	815.66667	54	29	68	27	237	28	258	28	28
193	,,	25/6/12	17	70	70.7	70.2	70.3	376	418	339	377.66667	25	17	38	17	125.8	18	138	17	17
194	,,	16/4/12	27	125	106	117	116	1146	1100	1090	1112	51.6	27	68	27	223	27	260	28	27

195	'	24/6/12	19	74.8	81.5	78.2	78.166667	445	529	486	486.66667	35.7	21	47.9	20	156	21	181	22	21
196	'	2/2/2012	37	139	140	139	139.33333	1490	1550	1550	1530	80.6	41	102	42	361	40	356	41	40
197	'	1/3/2012	32	131	132	134	132.33333	1370	1390	1420	1393.3333	73.1	37	86.3	37	331	37	332	38	37
198	,,	16/4/12	26	100	110	99.7	103.23333	900	960	960	940	48.5	26	64.8	26	220	26	245	26	26
199	23-10-12	27/5/12	20	103	99.9	109	103.96667	844	794	935	857.66667	45.6	25	61.9	25	206	25	231	25	25
200	'	2/3/2012	33	137	138	137	137.33333	1490	1510	1490	1496.6667	73.2	37	92.3	37	340	38	334	38	37
201	'	12/6/2012	18	99.4	100	99.3	99.566667	787	803	784	791.33333	38.2	22	55.5	23	188	24	212	23	23
202	'	7/5/2012	23	116	116	115	115.66667	1070	1070	1060	1066.6667	52.6	28	71.2	28	261	28	261	28	28
203	'	7/6/2012	19	105	108	96.5	103.16667	869	924	741	844.66667	45.9	25	60.6	24	223	24	223	24	24
204	'	6/5/2012	23	101	100	97	99.333333	900	876	889	888.33333	53	28	73.5	29	233	28	263	28	28
205	24/10/12	28/3/12	29	126	124	125	125	1260	1220	1250	1243.3333	66.5	34	83.8	33	304	34	311	34	34
206	'	20/5/12	22	93.1	93.3	97.7	94.7	690	693	760	714.33333	48.6	26	64.3	25	212	26	244	26	26
207	'	9/7/2012	23	78.7	74.3	75.5	76.166667	492	440	455	462.33333	29.2	19	43.8	19	135	19	160	18	19
208	,,	6/6/2012	20	80.5	78.9	75.4	78.266667	550	550	554	551.33333	31.8	19	43.2	19	143	19	173	19	19
209	'	20/3/12	30	119	117	111	115.66667	1130	1090	976	1065.3333	67.2	35	83.4	33	312	35	314	35	34
210	,,	21/9/12	35	156	151	151	152.66667	1940	1810	1800	1850	77.3	39	92.2	37	360	40	349	40	39
211	,,	27/6/12	17	70.9	70.6	71	70.833333	433	510	455	466	27.2	18	41.7	18	128	18	150	18	18
212	'	6/5/2012	23	101	108	103	104	817	924	848	863	53.4	28	72.9	29	242	29	277	30	29
213	'	12/5/2012	23	108	102	105	105	923	821	872	872	50	27	68.4	27	233	28	251	27	27
214	'	21/4/12	26	110	109	110	109.66667	959	934	957	950	58.6	30	72.9	29	251	29	276	30	29
215	'	15/7/12	14	67	67.7	67.9	67.533333	357	365	367	363	31.1	20	44.5	19	135	19	160	18	19
216	,,	4/7/2012	16	55.1	53.8	56.6	55.166667	235	230	255	240	20	16	33.1	16	123	16	104	16	16
217	'	11/5/2012	23	111	113	112	112	956	1010	1000	988.66667	55.7	29	72.8	29	243	29	266	29	29
218	'	14/4/12	27	124	129	126	126.33333	1220	1330	1260	1270	64.7	33	82.6	33	280	32	300	33	32
219	,,	6/6/2012	20	86.9	89.4	85.4	87.233333	702	650	690	680.66667	32	20	48	20	154	20	173	20	20
220	'	6/6/2012	20	88.4	88.3	84.7	87.133333	618	620	571	603	31.9	20	51	21	159	21	174	20	20
221	,,	1/8/2012	12	43.9	49.5	44.3	45.9	167	143	187	165.66667	17	14	27	14	80	14	93.6	14	14
222	'	23/7/12	12	72.8	75.4	73.4	73.866667	422	452	426	433.33333	28.4	18	42	18	132	19	150	18	18
223	'	27/4/12	25	118	116	117	117	1110	1070	1090	1090	60.2	31	78.4	31	283	32	291	32	31
224	25/10/12	10/5/2012	23	112	115	112	113	999	1040	1000	1013	55	29	70.4	28	247	29	266	29	28
225	'	26/4/12	25	132	129	131	130.66667	1380	1330	1370	1360	60.7	31	77.7	31	260	30	288	31	31
226	'	27/6/12	16	94	91.6	90.2	91.933333	703	668	648	673	39	22	51	21	171	22	188	22	21
227	'	14/8/12	10	55.3	54.3	57.4	55.666667	243	234	262	246.33333	18.9	16	31.5	16	101	16	128	16	16

228	'	3/5/2012	24	107	110	108	108.33333	895	1000	925	940	56.8	29	70.9	28	256	30	266	29	29
229	'	1/4/2012	29	124	124	124	124	1220	1220	1220	1220	67.2	35	87.5	35	308	35	314	35	35
230	,,	28/6/12	17	70	70.7	70.2	70.3	376	418	339	377.66667	25	17	38	17	125.8	18	138	17	17
231	,,	26/1/12	40	135	136	134	135	1480	1480	1430	1463.3333	76.9	39	96.5	39	354	40	374	40	40
232	'	17/3/12	31	132	133	132	132.33333	1380	1410	1380	1390	73.6	37	91.2	36	330	37	322	36	36
233	'	23/6/12	17	91.1	89.4	93.7	91.4	661	636	698	665	41.2	23	56	23	176	23	212	23	23
234	26/10/12	1/7/2012	16	85	85	84.5	84.833333	574	576	565	571.66667	39.4	22	51.7	21	155	21	197	21	21
235	'	7/4/2012	28	119	118	120	119	1130	1100	1140	1123.3333	66.3	34	84.3	33	300	34	305	34	33
236	'	27/5/12	21	106	100	102	102.66667	888	803	822	837.66667	49.9	27	62.7	25	208	25	232	25	25
237	'	22/8/12	9	54.3	52.3	56	54.2	233	217	249	233	16.3	15	34.3	16	99.1	16	122	16	15
238	,,	15/6/12	19	72.2	70.9	71.1	71.4	438	440	500	459.33333	27.6	18	42.1	18	140	19	152	18	18
239	,,	20/1/12	40	139	140	141	140	1575	1600	1530	1568.3333	78	40	97	39	354	39	356	39	39
240	'	13/7/12	28	49.9	53.4	50.9	51.4	200	220	215	211.66667	15	15	31.5	16	89.6	15	111	15	15
241	'	1/4/2012	29	121	117	121	119.66667	1170	1090	1170	1143.3333	69	35	87.2	35	299	34	305	34	34
242	'	1/4/2012	29	134	128	133	131.66667	1440	1310	1410	1386.6667	67.2	35	84.9	34	309	35	313	35	34
243	..	23/7/12	13	67.5	72.1	67.2	68.933333	364	413	364	380.33333	28.3	19	44.8	19	137	19	168	19	19
244	'	1/8/2012	12	76	73.5	76.9	75.466667	459	430	470	453	27.9	18	45.3	19	127	18	150	18	18
245	'	9/7/2012	15	75.4	75.5	71.8	74.233333	452	454	410	438.66667	36	21	47.5	20	158	21	190	21	20
246	'	15/3/12	31	137	137	135	136.33333	1490	1480	1450	1473.3333	73.2	37	91.7	37	342	38	328	37	37
247	29/10/12	26/4/12	26	113	113	111	112.33333	1030	1010	976	1005.3333	59.9	31	77	30	270	31	275	30	30
248	'	20/7/12	28	100	106	110	105.33333	910	920	900	910	54	29	68	27	237	28	258	28	28
249	'	14/6/12	19	104	104	99.7	102.56667	868	859	784	837	44.3	24	58.9	24	197	24	218	23	24
250	'	14/6/12	19	96.5	94.5	100	97	790	790	820	800	42.5	24	57.7	23	194	24	215	23	23
251	'	4/7/2012	19	75.8	77.1	73.5	75.466667	457	473	430	453.33333	34.2	21	45.7	19	154	21	173	19	20
252	5/11/2012	25/2/12	35	128	128	125	127	1290	1310	1250	1283.3333	77.3	39	96.8	39	353	39	345	39	39
253		24/2/12	35	130	130	129	129.66667	1340	1340	1310	1330	77.9	39	96.3	39	357	40	335	38	39
254	'	16/3/12	32	146	144	144	144.66667	1680	1660	1660	1666.6667	69.9	36	89.1	36	326	37	325	36	36
255	'	24/3/12	31	113	111	111	111.66667	1030	972	976	992.66667	54.6	29	81	32	268	31	281	31	31
256	5/11/2012	25/2/12	35	128	128	125	127	1290	1310	1250	1283.3333	77.3	39	96.8	39	353	39	345	39	39
257	'	5/7/2012	17	85	92	88	88.333333	574	674	622	623.33333	33.6	21	50.2	21	160	21	183	20	21
258	'	3/4/2012	30	124	125	128	125.66667	1220	1250	1280	1250	66.4	34	83.7	33	301	34	301	33	33
259	,,	25/6/12	19	78.7	78.8	76.9	78.133333	560	574	588	574	30.3	19	46	19	140	18	165	19	19
260	'	2/2/2012	37	139	140	131	136.66667	1490	1550	1480	1506.6667	80.6	41	102	42	361	40	356	41	40

261	'	8/5/2012	25	106	102	104	104	888	821	858	855.66667	55.5	29	70.5	28	243	29	257	28	28
262	'	16/7/12	15	72.6	74.2	75.8	74.2	420	438	458	438.66667	30.6	19	43.9	19	143	20	164	19	19
263	,,	19/3/12	33	136	135	133	134.66667	1380	1400	1380	1386.6667	64.8	33	88	33	286	33	312	34	33
264	'	13/7/12	16	75.9	72.7	72.5	73.7	409	420	418	415.66667	32.5	20	47.5	20	154	21	170	19	20
265	,,	2/6/2012	22	105	96.8	102	101.26667	869	746	822	812.33333	41.5	23	54.7	22	186	23	202	22	22
266	,,	25/6/12	19	86.8	80.7	83.6	83.7	580	620	620	606.66667	32.9	20	53.2	20	155	20	178	20	20
267	'	30/7/12	28	96	106	102	101.33333	734	891	822	815.66667	54	29	68	27	237	28	258	28	28
268	8/11/2012	11/3/2012	34	122	119	119	120	1180	1120	1120	1140	72.9	37	96.5	37	334	37	329	37	37
269	'	13/6/12	20	101	98.3	96.3	98.533333	817	763	722	767.33333	44	24	59.9	24	200	25	228	24	24
270	'	28/3/12	31	120	118	120	119.33333	1140	1100	1140	1126.6667	67.5	35	86.4	34	309	35	319	35	34
271	'	16/6/12	20	90	87.1	85	87.366667	645	604	575	608	43.3	24	55.7	23	198	24	212	23	23
272	'	2/6/2012	22	101	98.8	104	101.26667	817	777	858	817.33333	49.4	26	65.3	26	249	29	239	26	26
273	'	26/3/12	32	125	125	123	124.33333	1240	1250	1200	1230	67.9	35	84.5	33	310	35	319	35	34
274	'	1/4/2012	31	130	132	126	129.33333	1340	1390	1260	1330	68.6	35	86.9	35	308	35	319	35	35
275	,,	12/7/2012	17	70	70.7	70.2	70.3	376	418	339	377.66667	25	17	38	17	125.8	18	138	17	17
276	'	2/6/2012	22	101	103	100	101.33333	817	840	798	818.33333	47.1	26	61.7	25	202	25	230	25	25
277	'	5/4/2012	30	118	113	114	115	1110	1010	1030	1050	66.9	34	80.1	32	295	33	304	33	33
278	'	26/7/12	15	52	52	51.7	51.9	190	220	200	203.33333	15	15	31.5	16	89.6	15	111	15	15
279	'	28/5/12	23	97.9	95.9	97.4	97.066667	762	732	755	749.66667	51.2	27	67.5	27	236	28	259	28	27
280	12/11/2012	27/5/12	23	109	106	106	107	950	891	900	913.66667	50	27	68.4	27	230	27	251	27	27
281	'	24/3/12	32	131	132	132	131.66667	1370	1390	1380	1380	70.2	36	88.8	36	319	36	322	36	36
282	'	27/6/12	19	120	116	117	117.66667	1140	1070	1090	1100	50.8	27	66.7	27	225	27	251	27	27
283	'	24/7/12	15	75.8	72.6	76.5	74.966667	457	420	463	446.66667	30.9	19	44.9	19	140	19	164	19	19
284	'	11/3/2012	34	141	143	141	141.66667	1580	1630	1570	1593.3333	75.4	38	93.6	38	349	39	335	38	38
285	'	27/8/12	10	48.8	46.6	47.4	47.6	159	159	200	172.66667	14	14	26.5	14	82	15	109	15	14
286	'	8/8/2012	13	66.4	62.8	66.2	65.133333	351	314	348	337.66667	24.3	17	37.8	17	121	18	150	18	17
287		24/2/12	35	130	130	129	129.66667	1340	1340	1310	1330	77.9	39	96.3	39	357	40	335	38	39
288	,,	18/6/12	21	93	94.5	96	94.5	702	690	700	697.33333	34	21	50.6	21	169	21	175	21	21
289	'	11/4/2012	30	131	131	128	130	1370	1360	1300	1343.3333	66.6	34	86.5	34	296	34	311	34	34
290	'	29/5/12	23	108	107	104	106.33333	923	916	858	899	51.3	27	68.5	27	232	28	251	27	27
291	16/11/12	27/4/12	28	132	135	129	132	1380	1420	1310	1370	62.4	32	79.3	31	273	31	287	31	31
292	,,	6/6/2012	19	73	74	72.9	73.3	430	500	500	476.66667	27.9	18	43.2	18	128	18	148	18	18
293	'	7/9/2012	9	45.4	45	47	45.8	190	180	201	190.33333	12.8	14	28.9	15	74	14	101	14	14

294	'	13/5/12	26	114	114	117	115	1040	1040	1090	1056.6667	57.7	30	72.1	28	262	30	288	31	30
295	'	17/4/12	30	126	126	125	125.66667	1250	1250	1250	1250	66.1	34	80.2	32	298	34	307	34	33
296	'	19/4/12	29	126	125	125	125.33333	1260	1250	1250	1253.3333	66.7	34	84.4	33	300	34	304	33	34
297	'	11/4/2012	30	132	129	132	131	1380	1330	1380	1363.3333	70.7	36	87.8	35	313	35	316	35	35
298	19/11/12	11/7/2012	18	94.7	91.2	95.2	93.7	714	660	722	698.66667	36.7	22	51.3	21	196	21	196	21	21
299	'	19/4/12	30	134	131	131	132	1440	1360	1370	1390	66.6	34	85	35	310	35	312	34	34
300	'	21/5/12	25	119	119	120	119.33333	1130	1120	1140	1130	52.7	28	67.8	27	243	29	252	27	28
301	'	24/5/12	24	109	103	105	105.66667	950	840	872	887.33333	56.1	29	73.8	29	253	30	260	28	29
302	'	15/5/12	26	118	115	114	115.66667	1110	1040	1030	1060	58	30	73.8	29	253	30	280	30	30
303	'	22/6/12	21	97.2	98	97.3	97.5	731	764	753	749.33333	45.3	25	64.1	25	196	24	224	24	24
304	,,	8/5/2012	27	123	124	123	123.33333	1190	1220	1200	1203.3333	60.6	31	77.6	31	267	31	291	32	31
305	23/11/12	7/3/2012	36	150	147	144	147	1780	1730	1660	1723.3333	72.7	37	90	36	337	38	330	37	37
306	'	1/4/2012	33	128	133	126	129	1290	1410	1260	1320	65.6	34	83.2	33	305	34	310	34	34
307	'	17/8/12	28	99.6	106	110	105.2	934	945	904	927.66667	54	29	68	27	237	28	258	28	28
308	'	6/8/2012	15	55.3	61.5	61.7	59.5	243	301	303	282.33333	20.3	16	34.7	16	104	16	122	16	16
309	'	27/6/12	20	93.7	92.7	88.4	91.6	699	684	608	663.66667	39	22	49.9	21	174	22	197	21	21
310	'	10/6/2012	23	88.5	92.5	96.7	92.566667	624	681	744	683	44	24	60.8	24	194	24	216	23	23
311	..	5/8/2012	15	55.5	55.8	54.5	55.266667	243	248	237	242.66667	19	16	32	16	94.9	16	115	15	15
312	26/11/12	6/3/2012	37	128	127	131	128.66667	1290	1280	1350	1306.6667	72	37	92.2	37	328	37	327	37	37
313	'	4/5/2012	29	122	114	117	117.66667	1180	1040	1090	1103.3333	56.2	29	64.4	27	247	29	264	28	28
314	,,	9/4/2012	34	139	139	139	139	1490	1490	1470	1483.3333	64.3	33	84	33	306	34	310	34	33
315	'	27/5/12	25	102	102	101	101.66667	821	821	813	818.33333	48.2	26	63.1	26	219	26	245	26	26
316	,,	28/5/12	26	99	97	98	98	930	900	960	930	48.5	26	64	26	220	26	243	26	26
317	,,	30/7/12	17	70	72	68.7	70.233333	380	417	340	379	25	17	39	17	126	18	136	17	17
318	'	3/7/2012	20	85.5	85.2	84.6	85.1	368	564	570	500.66667	35.2	21	47.5	20	146	146	184	20	20
319	'	6/8/2012	15	64.9	66.4	64.4	65.233333	335	350	320	335	20.4	16	36.7	17	104	16	104	16	16
320	3/12/2012	15/3/12	37	128	122	124	124.66667	1290	1180	1220	1230	71.4	36	89.6	37	323	36	333	38	36
321	'	25/3/12	35	130	124	126	126.66667	1340	1220	1260	1273.3333	68.8	35	86.4	34	315	34	324	36	35
322	'	2/3/2012	38	134	134	134	134	1440	1440	1420	1433.3333	74.6	38	93.8	38	353	39	342	38	38
323	'	14/4/12	32	124	123	124	123.66667	1220	1200	1220	1213.3333	61.1	32	80.5	32	255	30	300	33	32
324	'	8/3/2012	38	126	126	125	125.66667	1260	1260	1250	1256.6667	73.4	37	91.9	37	332	37	324	36	37
325	'	20/8/12	15	50.7	54	48.6	51.1	200	190	180	190	15	15	31.5	16	89.6	15	111	15	15
326	'	21/8/12	16	40.9	43.5	43.5	42.633333	133	150	150	144.33333	13.1	14	25.9	14	89.7	15	90.8	14	14

327	,,	19/3/12	35	156	155	155	155.33333	1930	1900	1750	1860	77.3	39	93	37	362	40	368	40	39
328	,,	16/7/12	22	105	96.8	102	101.26667	869	746	822	812.33333	41.5	23	54.7	22	186	23	202	22	22
329	'	25/4/12	19	115	114	113	114	1040	1040	1010	1030	60	31	75.9	30	255	30	276	30	30
330	10/12/2012	14/3/12	26	130	130	132	130.66667	1340	1340	1380	1353.3333	71.8	36	87.7	35	319	36	324	36	36
331	,,	16/7/12	21	98.9	96.8	99.2	98.3	810	769	780	786.33333	39.5	22	53	22	181	22	200	22	22
332	,,	25/3/12	36	121	121	117	119.66667	1170	1170	1090	1143.3333	67.1	35	90.8	36	306	35	323	36	35
333	,,	13/6/12	25	86.7	88.4	86.6	87.233333	598	620	567	595	43.6	24	59.3	24	199	25	233	24	24
334	,,	27/4/12	32	118	120	113	117	1110	1130	1010	1083.3333	58.9	30	73.5	29	268	31	273	29	30
335	,,	15/4/12	40	140	140	140	140	1560	1550	1550	1553.3333	79.9	40	96.4	39	360	40	334	38	39
336	,,	2/8/2012	14	93.2	90.3	94.5	92.666667	691	649	716	685.33333	30.1	19	46.3	19	149	20	178	20	19
337	,,	8/4/2012	34	134	131	134	133	1440	1360	1420	1406.6667	71	36	88.7	36	312	35	324	36	36
338	,,	14/7/12	20	105	107	105	105.66667	869	916	872	885.66667	39.2	22	54.2	22	182	23	206	22	22
339	'	3/9/2012	28	110	109	110	109.66667	890	1000	900	930	54	29	68	27	237	28	258	28	28
340	28/12/12	18/6/12	27	102	102	102	102	821	821	822	821.33333	42.6	26	65.4	26	221	27	237	25	29
341	,,	4/6/2012	27	125	106	117	116	1146	1100	1090	1112	51.6	27	68	27	223	27	260	28	27
342	,,	19/3/12	38	148	143	145	145.33333	1500	1490	1500	1496.6667	80	40	99	40	354	40	374	40	40
343	,,	9/6/2012	28	107	107	106	106.66667	895	916	900	903.66667	51.1	27	66.6	27	266	27	243	26	26
344	,,	25/4/12	34	128	130	127	128.33333	1290	1340	1280	1303.3333	64.2	33	83.9	33	286	33	278	33	33
345	,,	4/4/2012	37	129	130	126	128.33333	1320	1340	1260	1306.6667	71.9	36	88.7	36	320	36	321	36	36
346	,,	27/5/12	30	108	109	106	107.66667	923	934	900	919	54.2	29	76.2	30	246	29	264	28	29
347		24/2/12	35	130	130	129	129.66667	1340	1340	1310	1330	77.9	39	96.3	39	357	40	335	38	39
348	,,	9/9/2012	15	47	46.7	45.6	46.433333	198	188	200	195.33333	15.3	14	27.1	14	88.2	15	103	14	14
349	,,	10/6/2012	28	105	105	105	105	869	883	872	874.66667	52	28	70.1	28	230	27	256	27	27
350	,,	22/4/12	35	133	129	122	128	1410	1330	1190	1310	64.7	33	81.1	32	301	34	307	34	33
351	,,	3/5/2012	33	114	110	118	114	1040	1000	1100	1046.6667	61.4	32	77.9	31	295	33	301	33	32
352	,,	9/6/2012	28	104	97.6	102	101.2	868	758	822	816	49.1	26	65.7	26	213	26	243	26	26
353	,,	7/9/2012	16	55.1	53.8	56.6	55.166667	235	230	255	240	20	16	33.1	16	123	16	104	16	16
354	,,	20/4/12	35	135	134	134	134.33333	1440	1440	1420	1433.3333	64.8	33	80.2	32	282	32	288	31	32
355	,,	20/7/12	23	96.7	98.7	99.6	98.333333	890	871	900	887	43	24	59.7	24	198	24	220	24	24
356	,,	22/7/12	22	82.9	83.8	84	83.566667	547	559	562	556	33.2	20	46.7	20	152	20	170	19	19
357	,,	20/3/12	40	152	152	152	152	1830	1830	1830	1830	72.6	37	93.5	37	337	38	362	37	37
358	,,	6/4/2012	37	142	143	142	142.33333	1600	1630	1600	1610	67	35	87.7	35	311	35	322	36	35
359	29/12/12	13/4/12	36	136	135	136	135.66667	1360	1440	1470	1423.3333	65.8	34	85.3	34	300	34	319	35	34

360	,,	25/8/12	18	86.5	89.5	90.3	88.766667	549	565	596	570	28.9	19	45.9	19	150	19	169	19	19
361	,,	7/4/2012	37	125	125	125	125	1240	1250	1250	1246.6667	67.2	35	86.2	35	314	35	322	36	35
362	,,	8/9/2012	26	62	62.8	59.4	61.4	305	314	281	300	21.3	16	35.6	17	104	16	130	16	16
363	,,	9/5/2012	33	113	109	112	111.33333	1030	934	1000	988	61	31	76	30	273	31	290	32	31
364	,,	9/6/2012	28	99.2	96.6	98.7	98.166667	783	742	776	767	50.7	27	68.9	27	242	29	252	27	27
365	,,	3/5/2012	33	126	128	125	126.33333	1260	1310	1250	1273.3333	61.4	32	81	32	282	32	304	33	32
366	,,	1/9/2012	17	70	70.7	70.2	70.3	376	418	339	377.66667	25	17	38	17	125.8	18	138	17	17
367	,,	6/7/2012	24	89	90.7	89	89.566667	630	655	631	638.66667	40.9	23	54.4	22	175	22	194	21	22
368	,,	7/4/2012	38	156	156	156	156	1930	1920	1950	1933.3333	78	39	93.6	37	360	39	350	39	39
369	,,	8/9/2012	17	70.8	72.4	76	73.066667	500	430	460	463.33333	26.9	18	43.2	18	130	18	144.8	18	18
370	4/1/2013	12/7/2012	24	97	96.2	96.6	96.6	749	736	742	742.33333	46.8	25	60.5	24	205	25	223	24	24
371	,,	4/7/2012	25	103	103	103	103	844	840	848	844	47.9	26	64.3	25	215	26	238	25	25
372	,,	1/5/2012	34	132	132	129	131	1380	1390	1310	1360	69.3	35	86.4	34	321	36	329	37	35
373	,,	15/6/12	28	112	113	117	114	999	1010	1090	1033	56.5	29	74.5	29	250	29	281	31	29
374	,,	6/7/2012	25	113	115	114	114	1030	1040	1030	1033.3333	48.2	26	60.6	24	215	26	235	25	25
375	'	2/2/2012	37	139	140	131	136.66667	1490	1550	1480	1506.6667	80.6	41	102	42	361	40	356	41	40
376	,,	14/4/12	37	137	140	137	138	1490	1550	1490	1510	74	37	93.1	37	332	37	340	39	37
377	,,	24/8/12	19	93.7	92.8	94	93.5	650	690	704	681.33333	35	21	50.8	21	168	21	183	21	21
378	,,	26/4/12	35	138	138	137	137.66667	1500	1510	1490	1500	73.7	37	88.4	35	318	36	326	37	36
379	,,	12/8/2012	20	91.2	88.4	93.9	91.166667	660	620	701	660.33333	35.7	21	47.6	20	162	22	175	20	20
380	'	21/9/12	15	49.9	50.7	50.7	50.433333	199	180	190	189.66667	15	15	31.5	16	89.6	15	111	15	15
381	,,	18/6/12	28	131	124	132	129	1370	1220	1380	1323.3333	56.4	29	75	30	256	30	274	29	29
382	,,	3/5/2012	34	142	141	140	141	1600	1580	1550	1576.6667	67.5	35	89.8	36	314	35	317	35	35
383	,,	21/9/12	17	70	72	68.7	70.233333	380	417	340	379	25	17	39	17	126	18	136	17	17
384	,,	22/7/12	23	105	103	104	104	869	840	858	855.66667	42.3	24	56.9	23	193	24	220	24	23
385	'	28/9/12	28	110	109	109	109.33333	734	891	822	815.66667	54	29	68	27	237	28	258	28	28
386	,,	28/9/12	14	50.7	46.8	52.2	49.9	211	150	233	198	16.9	14	27.1	14	81.1	14	92.9	14	14
387	,,	1/9/2012	17	69.1	70	70	69.7	632	634	634	633.33333	28.3	19	41	18	132	19	152	18	18
388	5/1/2013	2/6/2012	30	122	123	122	122.33333	1180	1180	1190	1183.3333	59.2	31	73	29	270	31	283	31	30
389	,,	16/5/12	33	114	119	114	115.66667	1040	1120	1030	1063.3333	64.1	33	83	33	287	33	318	35	33
390	,,	2/9/2012	17	74.4	76.6	74.2	75.066667	440	467	438	448.33333	27.1	18	40.8	18	133	19	154	18	18
391	,,	8/6/2012	29	119	120	122	120.33333	1130	1130	1190	1150	58.7	30	75.3	30	257	30	291	32	30
392	,,	15/4/12	29	133	139	135	135.66667	1410	1530	1450	1463.3333	73.2	37	92.3	37	330	37	346	40	37

393	,,	1/9/2012	18	73	72.3	74	73.1	480	435	502	472.33333	28	18	39.9	18	123	18	146	18	18
394	'	7/4/2012	38	139	140	135	138	1490	1480	1480	1483.3333	79	40	99	41	361	40	356	41	40
395	,,	7/5/2012	34	128	130	128	128.66667	1290	1340	1300	1310	68.1	35	86.4	34	315	34	327	37	35
396	'	22/9/12	15	39.2	38.4	40.2	39.266667	122	120	126	122.66667	15	15	31.5	16	89.6	15	111	15	15
397	,,	31/3/12	40	160	165	150	158.33333	1990	2010	1850	1950	79	40	98	40	346	39	350	40	40
398	,,	11/5/2012	33	133	133	133	133	1410	1410	1410	1410	66.2	34	83.5	33	281	32	304	33	33
399	,,	4/5/2012	34	131	134	134	133	1370	1440	1420	1410	67.5	35	82.7	33	303	34	315	35	34
400	,,	2/8/2012	22	105	96.8	102	101.26667	869	746	822	812.33333	41.5	23	54.7	22	186	23	202	22	22
401	,,	19/6/12	28	105	95.8	99.4	100.06667	869	730	786	795	56.1	29	71.1	28	251	29	272	29	29
402	,,	15/9/12	16	63	63.8	60.2	62.333333	306	314	290	303.33333	22	16	36	17	104	16	129	16	16
403	,,	6/7/2012	25	102	101	106	103	821	811	900	844	50.9	27	69.4	27	216	26	256	27	27
404	,,	19/6/12	28	114	112	113	113	1040	1020	1020	1026.6667	53.8	28	76.4	30	244	29	268	29	29
405	7/1/2013	22/3/12	40	133	134	134	133.66667	1410	1440	1420	1423.3333	75.8	38	91.9	37	351	39	351	39	38
406	,,	2/4/2012	40	140	156	150	148.66667	1500	1440	1440	1460	80	40	96	38	354	40	374	40	40
407	,,	12/8/2012	16	73.3	71.1	71.2	71.866667	428	402	403	411	25.6	18	41.9	18	140	19	149	18	18
408	,,	4/5/2012	35	129	128	128	128.33333	1320	1310	1310	1313.3333	62.5	32	80.4	32	276	32	278	33	32
409	,,	25/5/12	32	130	129	132	130.33333	1340	1330	1380	1350	63.7	33	80.5	32	295	33	310	34	33
410	,,	6/4/2012	39	134	135	136	135	1440	1420	1470	1443.3333	71.7	36	88.4	35	323	36	319	35	35
411	,,	23/8/12	19	60.1	58.1	60.1	59.433333	287	269	287	281	20.1	16	37.3	17	112	17	134	16	16
412	,,	20/5/12	32	112	112	112	112	999	1020	1000	1006.3333	58	30	74.1	29	242	29	282	30	29
413	,,	18/4/12	37	134	134	132	133.33333	1440	1440	1380	1420	69	35	82.9	33	306	35	308	34	34
414	,,	5/5/2012	34	129	129	131	129.66667	1320	1330	1350	1333.3333	61.2	32	78.2	31	289	33	290	32	32
415	,,	2/4/2012	39	138	138	138	138	1500	1510	1510	1506.6667	72.6	37	85.3	34	335	37	334	38	36
416	,,	8/10/2012	13	50.7	50.7	50.7	50.7	220	220	246	228.66667	18	14	30	15	80.9	14	97.7	14	14
417	,,	20/5/12	32	108	108	111	109	923	924	976	941	59	30	74.1	29	261	28	279	30	29
418	,,	17/7/12	24	78.9	79.8	76.8	78.5	495	507	469	490.33333	36.6	22	49.9	21	166	22	192	21	21
419	,,	15/4/12	40	140	140	140	140	1560	1550	1550	1553.3333	79.9	40	96.4	39	360	40	334	38	39
420	'	1/10/2012	28	99.8	106	110	105.26667	890	905	928	907.66667	54	29	68	27	237	28	258	28	28
421	,,	6/5/2012	34	133	130	131	131.33333	1410	1340	1370	1373.3333	62.8	32	79.8	32	288	33	305	34	32
422	,,	6/5/2012	34	110	109	110	109.66667	959	934	957	950	62.7	32	78.8	31	282	32	307	34	32
423	,,	19/5/12	33	124	124	127	125	1230	1220	1280	1243.3333	57.3	30	73.2	29	261	28	279	30	29
424	,,	24/4/12	36	122	124	125	123.66667	1180	1220	1250	1216.6667	67	35	80.7	32	300	34	305	34	33
425	,,	6/5/2012	34	123	120	120	121	1190	1130	1140	1153.3333	61.6	32	78.6	31	268	31	305	34	32

426	8/1/2013	4/6/2012	31	120	120	120	120	1140	1130	1140	1136.6667	63.3	33	74.8	30	267	31	297	32	31
427	,,	20/6/12	27	99.6	99.5	98.9	99.333333	789	788	778	785	47.2	26	61.9	25	206	25	235	25	25
428	,,	24/3/12	40	150	149	148	149	1780	1760	1730	1756.6667	74.5	38	93.2	37	342	38	342	38	37
429	,,	26/7/12	23	98.7	99.4	98.9	99	775	787	778	780	36.1	21	49.9	21	151	20	182	20	20
430	,,	17/5/12	38	125	129	121	125	1240	1330	1170	1246.6667	59.3	31	77.3	30	285	33	294	32	31
431	,,	6/7/2012	26	108	108	106	107.33333	923	924	900	915.66667	44.1	24	63.4	25	197	24	222	24	24
432	,,	10/7/2012	26	105	105	107	105.66667	869	883	919	890.33333	42.8	24	60.6	24	180	23	226	24	24
433	,,	14/5/12	34	119	119	118	118.66667	1130	1120	1100	1116.6667	60.2	31	83.3	33	273	31	292	32	31
434	,,	7/4/2012	39	134	131	134	133	1440	1360	1420	1406.6667	73.4	37	92.6	37	335	37	328	37	37
435	,,	24/7/12	24	99.7	111	100.6	103.76667	900	890	890	893.33333	42.6	24	58.9	24	200	24	219	24	24
436	,,	1/5/2012	36	130	131	129	130	1340	1360	1310	1336.6667	66.8	34	84.6	32	304	34	316	35	33
437	,,	10/4/2012	38	150	144	142	145.33333	1510	1480	1490	1493.3333	72.7	37	90.5	36	324	37	328	37	40
438	,,	12/8/2012	21	88.8	90.4	85	88.066667	628	650	574	617.33333	31.2	20	47.6	20	161	21	174	20	20
439	,,	4/5/2012	35	131	134	129	131.33333	1370	1440	1310	1373.3333	65.1	34	83.8	33	302	34	307	34	33
440	,,	21/8/12	20	86.7	88	87.9	87.533333	760	800	800	786.66667	30.9	20	52.5	20	156	20	185	21	20
441	,,	17/4/12	38	123	125	124	124	1850	1200	1220	1423.3333	76.8	39	96	39	352	39	350	39	39
442	'	25/9/12	15	39.2	38.4	40.2	39.266667	122	120	126	122.66667	15	15	31.5	16	89.6	15	111	15	15
443	,,	27/5/12	32	129	128	129	128.66667	1320	1310	1310	1313.3333	60.4	31	77.4	30	265	31	286	31	31
444	,,	11/5/2012	34	137	136	136	136.33333	1490	1480	1470	1480	4.6	33	82.7	33	305	34	309	34	33
445	,,	11/6/2012	30	113	113	116	114	1030	1010	1080	1040	54.7	29	70.2	28	240	28	274	29	28
446	,,	2/5/2012	36	145	144	144	144.33333	1650	1660	1660	1656.6667	66.2	34	86.9	35	288	33	323	36	34
447	10/1/2013	17/6/12	30	125	123	123	123.66667	1240	1200	1200	1213.3333	52.5	28	67.9	27	230	27	262	31	28
448	,,	3/5/2012	35	131	134	128	131	1370	1440	1300	1370	66.6	34	81.4	32	309	35	313	35	34
449	,,	26/3/12	42	137	141	138	138.66667	1490	1580	1510	1526.6667	77	39	91.1	36	348	39	348	40	38
450	,,	17/4/12	38	140	140	140	140	1500	1550	1550	1533.3333	69.5	36	89	36	327	37	322	36	36
451	,,	3/4/2012	40	142	140	141	141	1600	1550	1570	1573.3333	76.3	38	91	38	357	40	335	38	38
452	,,	14/5/12	34	118	118	116	117.33333	1110	1100	1080	1096.6667	63.7	33	74.4	29	281	32	278	33	31
453	,,	7/6/2012	30	115	111	111	112.33333	1040	972	976	996	58.7	30	75.6	30	261	28	273	29	29
454	'	4/10/2012	28	96	106	102	101.33333	734	891	822	815.66667	54	29	68	27	237	28	258	28	28
455	,,	19/6/12	29	107	106	107	106.66667	895	891	919	901.66667	52.3	28	72.1	28	254	30	264	28	29
456	,,	14/6/12	29	120	123	123	122	1150	1200	1200	1183.3333	55.2	29	72.3	28	266	27	273	29	28
457	,,	9/8/2012	22	96.3	99	101	98.766667	793	810	799	800.66667	38.9	22	52.9	22	176.9	22	185	22	22
458	,,	12/4/2012	39	160	150	145	151.66667	1900	1900	1900	1900	76.5	39	92.7	37	364	40	389	40	39

459	,,	1/5/2012	36	136	131	131	132.66667	1480	1360	1360	1400	67.1	35	81.9	33	314	35	313	35	34
460	,,	27/5/12	33	119	119	118	118.66667	1130	1120	1100	1116.6667	61	31	78.6	31	265	31	285	32	31
461	,,	23/7/12	24	99.5	93.8	93.7	95.666667	787	700	699	728.66667	40.6	23	57.9	23	177	23	210	23	23
462	12/1/2013	2/4/2012	40	118	117	120	118.33333	1110	1090	1140	1113.3333	72.2	37	92.3	37	335	37	377	36	37
463	,,	19/4/12	38	138	139	136	137.66667	1500	1530	1470	1500	68	35	90.5	36	314	35	320	36	35
464	,,	21/6/12	29	101	107	103	103.66667	817	916	848	860.33333	47.4	26	61.2	24	200	25	225	24	25
465	,,	20/5/12	33	125	124	124	124.33333	1240	1220	1220	1226.6667	57.3	30	77.8	31	253	30	270	29	30
466	,,	21/4/12	38	125	125	125	125	1290	1240	1250	1260	77	39	98	39	350	39	348	39	39
467	,,	25/8/12	20	90.3	90.3	89.7	90.1	600	548	560	569.33333	31.7	19	45.9	19	149	19	169	19	19
468	,,	22/6/12	29	111	107	106	108	957	916	900	924.33333	50.8	27	63	25	209	25	238	25	25
469	,,	3/6/2012	32	113	114	111	112.66667	1030	1040	976	1015.3333	54.2	29	70.8	28	254	30	258	28	28
470	,,	16/5/12	34	124	123	123	123.33333	1220	1200	1200	1206.6667	60.2	31	75.1	30	264	31	286	31	30
471	,,	20/4/12	38	141	140	140	140.33333	1580	1550	1550	1560	69	35	89	36	315	34	319	35	35
472	,,	5/8/2012	22	81	78.1	78.1	79.066667	522	486	485	497.66667	31.6	20	47.5	20	150	20	173	19	20
473	5/11/2012	25/2/12	35	128	128	125	127	1290	1310	1250	1283.3333	77.3	39	96.8	39	353	39	345	39	39
474	,,	3/4/2012	40	154	154	153	153.66667	1880	1870	1850	1866.6667	72.2	37	90.4	36	341	38	374	38	37
475	,,	22/4/12	37	132	129	126	129	1380	1330	1260	1323.3333	68.5	35	80.5	32	303	34	317	35	34
476	,,	11/5/2012	35	127	126	126	126.33333	1280	1260	1260	1266.6667	61.6	32	81	32	271	31	301	33	32
477	,,	5/5/2012	35	132	131	132	131.66667	1380	1360	1380	1373.3333	64.8	33	86.1	32	286	33	312	34	33
478	,,	17/5/12	34	113	116	119	116	1030	1070	1120	1073.3333	60.7	31	77.8	31	260	30	294	32	31
479	,,	23/3/12	42	148	146	148	147.33333	1720	1680	1730	1710	76.3	38	88.9	36	365	40	373	39	38
480	14/1/13	16/4/12	39	134	132	132	132.66667	1440	1390	1380	1403.3333	69.6	36	88.5	36	319	36	320	36	36
481	,,	18/5/12	34	106	110	108	108	888	1000	925	937.66667	51.8	27	64.7	26	226	27	251	27	26
482	,,	7/5/2012	36	125	125	125	125	1240	1250	1250	1246.6667	63.8	33	81.8	33	278	32	301	33	32
483	,,	12/5/2012	35	118	119	116	117.66667	1110	1120	1080	1103.3333	62	32	76.9	30	259	30	290	32	31
484	,,	23/7/12	25	97	98.2	95	96.733333	749	768	731	749.33333	39.1	22	50.4	21	173	22	192	21	21
485	,,	20/8/12	20	67.5	65.2	70.5	67.733333	364	338	393	365	25.8	18	41.2	18	136	19	154	18	18
486	,,	6/4/2012	40	137	135	137	136.33333	1490	1410	1490	1463.3333	72.8	37	90.1	36	328	37	333	38	37
487	,,	8/10/2012	14	50.5	46.7	48	48.4	190	180	200	190	18	14	26	14	80.3	14	99.8	15	14
488	,,	14/4/12	39	137	137	137	137	1490	1480	1490	1486.6667	70.3	36	90.2	36	321	36	330	37	36
489	,,	22/7/12	25	96.2	98.5	96.5	97.066667	736	771	741	749.33333	43.9	24	62.1	25	190	24	230	25	24
490	,,	17/9/12	17	70	70.7	70.2	70.3	376	418	339	377.66667	25	17	38	17	125.8	18	138	17	17
491	,,	18/6/12	30	108	113	106	109	923	1010	900	944.33333	54.6	29	67.4	27	243	29	257	28	28

492	,,	8/8/2012	22	90	89.4	93.8	91.066667	645	636	700	660.33333	33.7	21	51	21	170	22	197	21	21
493	,,	14/8/12	21	96.1	94.7	95.6	95.466667	735	714	727	725.33333	34.2	21	49.5	20	154	21	180	20	20
494	,,	20/5/12	34	141	137	133	137	1580	1480	1410	1490	61.8	32	81.5	33	287	33	302	33	32
495	,,	3/8/2012	21	98.8	101	92.4	97.4	776	811	754	780.33333	40	23	54.6	22	193	24	200	22	23
496	,,	13/4/12	39	147	150	149	148.66667	1710	1790	1770	1756.6667	74.6	38	89.1	36	356	39	373	39	38
497	,,	14/5/12	35	138	140	139	139	1500	1550	1530	1526.6667	66.2	34	86.2	34	308	35	305	34	34
498	,,	5/9/2012	18	90.2	93.1	90.3	91.2	647	690	647	661.33333	28.1	18	43.3	19	132	19	159	18	18
499	15/1/13	29/5/12	32	140	142	140	140.66667	1560	1560	1550	1556.6667	61.6	32	78	31	285	33	301	33	32
500	,,	13/6/12	30	112	108	110	110	999	924	957	960	50.7	27	72.2	28	252	29	268	29	28
501	,,	11/9/2012	17	69	72.3	64.9	68.733333	379	416	335	376.66667	24.8	17	37.9	17	127	18	137	17	17
502	,,	3/7/2012	18	116	118	116	116.66667	1070	1100	1080	1083.3333	51.3	27	62.7	25	229	27	251	27	26
503	,,	26/7/12	25	101	100	106	102.33333	817	803	900	840	43.7	24	58	23	189	24	217	23	24
504	,,	10/7/2012	27	116	115	117	116	1070	1040	1090	1066.6667	49.1	26	64.1	25	236	28	240	26	26
505	,,	16/7/12	26	114	110	108	110.66667	1040	1000	'925	988.33333	43.1	24	56.3	23	201	25	217	23	23
506	'	4/10/2012	28	96	106	102	101.33333	1008	968	1003	993	54	29	68	27	237	28	258	28	28
507	,,	14/4/12	39	150	146	149	148.33333	1780	1680	1770	1743.3333	74.2	38	89.9	36	350	39	341	39	38
508	,,	1/6/2012	32	119	114	117	116.66667	1130	1040	1090	1086.6667	61.3	32	79.2	31	267	31	287	31	31
509	16/1/13	22/6/12	38	116	113	116	115	1070	1010	1080	1053.3333	54.4	29	71.7	28	242	29	266	29	28
510	,,	25/4/12	38	144	148	147	146.33333	1490	1460	1500	1483.3333	76.5	39	102	40	334	40	370	40	40
511	'	2/2/2012	37	139	140	131	136.66667	1490	1550	1480	1506.6667	80.6	41	102	42	361	40	356	41	40
512	,,	29/8/12	20	90	90	96	92	703	689	690	694	35	21	50.9	21	170	21	187	21	21
513	,,	19/7/12	38	105	107	106	106	869	916	900	895	45.3	25	60.9	24	203	25	229	25	25
514	,,	11/6/2012	31	124	124	125	124.33333	1230	1220	1250	1233.3333	60.9	31	76.8	30	268	31	279	30	30
515	,,	6/6/2012	32	134	131	130	131.66667	1440	1360	1330	1376.6667	60.8	31	81.6	32	280	32	307	34	32
516	,,	27/6/12	29	117	121	121	119.66667	1090	1170	1170	1143.3333	54.2	29	68.5	27	245	27	256	27	27
517	,,	26/9/12	16	55.1	53.8	56.6	55.166667	235	230	255	240	20	16	33.1	16	123	16	104	16	16
518	,,	20/4/12	38	151	146	148	148.33333	1820	1680	1730	1743.3333	75.2	38	95.5	38	344	38	334	38	38
519	,,	8/6/2012	31	119	118	116	117.66667	1130	1100	1080	1103.3333	60.8	31	78	31	259	30	286	31	31
520	,,	10/5/2012	35	135	132	134	133.66667	1450	1390	1420	1420	67.3	35	85.5	34	314	35	329	37	35
521	,,	5/9/2012	19	80	73.4	70.4	74.6	510	495	500	501.66667	28.6	18	43	18	141	19	132	17	18
522	,,	1/9/2012	29	76.4	77.6	76.4	76.8	464	476	464	468	29.2	19	43.1	19	142	20	157	18	19
523	17/1/13	19/7/12	31	111	112	116	113	957	1020	1080	1019	45.7	25	58.5	24	199	25	229	25	24
524	,,	16/4/12	40	163	163	164	163.33333	2110	2110	2130	2116.6667	74.5	38	95.7	39	349	39	335	38	38

525	,,	15/9/12	18	66.8	65.3	65.3	65.8	355	339	339	344.33333	22.3	17	36.8	17	106	17	133	16	17
526	,,	10/4/2012	38	143	144	144	143.66667	1507	1510	1511	1509.3333	72.7	37	90.5	36	324	37	328	37	40
527	,,	8/6/2012	32	128	119	122	123	1290	1120	1190	1200	59.5	31	79.8	32	283	32	295	32	32
528	,,	9/7/2012	28	113	114	116	114.33333	1030	1040	1080	1050	51	27	64.8	26	228	27	246	26	26
529	,,	26/6/12	30	134	134	134	134	1440	1440	1420	1433.3333	64.7	33	82.4	33	313	35	299	32	33
530	,,	1/7/2012	29	107	111	107	108.33333	895	972	919	928.66667	52.8	28	67.1	28	245	27	263	28	27
531	18/1/13	1/5/2012	38	138	137	137	137.33333	1500	1480	1490	1490	71.2	36	89.3	36	342	38	326	37	36
532	,,	24/9/12	26	62	62.8	59.4	61.4	305	314	281	300	21.3	16	35.6	17	104	16	130	16	16
533	,,	27/5/12	34	129	129	129	129	1320	1330	1310	1320	63.8	33	79.1	31	278	32	284	31	32
534	,,	11/5/2012	36	143	144	144	143.66667	1630	1660	1660	1650	67.3	35	87.5	35	315	34	331	37	35
535	,,	31/8/12	20	79.4	80.6	87.7	82.566667	700	780	710	730	30	20	54	20	165	21	178	20	20
536	,,	7/9/2012	19	90.6	86.9	91.6	89.7	550	600	600	583.33333	29.8	19	45.9	19	149	19	166	19	19
537	,,	18/5/12	35	134	136	131	133.66667	1440	1480	1360	1426.6667	66	34	80.2	32	299	34	305	34	33
538	,,	12/10/2012	14	46.7	49.7	49.9	48.766667	190	190	209	196.33333	16.9	14	26.4	14	79.9	14	95.7	14	14
539	,,	1/7/2012	29	113	113	113	113	1030	1010	1020	1020	53.8	28	70.7	28	235	28	263	28	28
540	,,	8/9/2012	28	63.9	62.8	62.4	63.033333	325	314	310	316.33333	26.7	18	38.7	17	129	18	157	18	18
541	,,	7/7/2012	28	120	117	116	117.66667	1150	1090	1080	1106.6667	51.3	27	67.9	27	222	27	259	28	27
542	,,	2/9/2012	19	87.1	82.3	84.7	84.7	604	539	571	571.33333	31	19	45.6	19	154	21	166	19	19
543	'	5/10/2012	15	39.2	38.4	40.2	39.266667	122	120	126	122.66667	15	15	31.5	16	89.6	15	111	15	15
544	,,	4/6/2012	33	131	132	131	131.33333	1370	1390	1380	1380	61.2	32	76.7	30	273	31	287	31	31
545	,,	25/6/12	30	113	108	114	111.66667	1030	924	1030	994.66667	56	29	74.5	29	251	29	280	30	29
546	,,	25/5/12	34	145	142	144	143.66667	1650	1560	1660	1623.3333	73.7	37	94.3	38	340	38	344	39	38
547	,,	2/5/2012	38	143	143	143	143	1630	1630	1630	1630	70.7	36	88.7	36	320	36	333	38	36
548	,,	28/5/12	36	144	143	143	143.33333	1640	1630	1630	1633.3333	64	33	82.3	33	293	33	310	34	33
549	,,	21/7/12	30	105	113	111	109.66667	869	1010	976	951.66667	46.7	25	63	25	215	26	246	26	25
550	,,	3/9/2012	19	82.8	80.3	81.2	81.433333	545	513	524	527.33333	30.2	19	48	20	138	19	175	20	19
551	,,	28/9/12	16	63	63.8	60.2	62.333333	306	314	290	303.33333	22	16	36	17	104	16	129	16	16
552	,,	22/7/12	30	110	108	112	110	959	924	1000	961	44.9	25	59.3	24	188	24	215	23	24
553	,,	6/8/2012	24	102	100	102	101.33333	821	803	822	815.33333	41.8	23	58	23	191	24	209	23	23
554	,,	3/5/2012	37	135	130	134	133	1430	1340	1420	1396.6667	70	36	86.3	34	325	36	318	35	35
555	,,	20/5/12	35	139	135	135	136.33333	1490	1450	1450	1463.3333	65.3	34	80.1	32	295	33	304	33	33
556	,,	13/5/12	36	128	128	128	128	1290	1310	1300	1300	68.4	35	83.6	33	299	34	319	35	34
557	,,	19/6/12	31	121	119	119	119.66667	1170	1120	1120	1136.6667	58.6	30	72.8	29	245	29	280	30	29

558	,,	16/4/12	40	114	112	108	111.33333	1040	1020	925	995	47.9	26	63.6	25	211	26	238	25	25
559	,,	12/6/2012	32	127	127	127	127	1280	1280	1280	1280	60.4	31	74.8	30	279	32	294	32	31
560	,,	14/5/12	36	129	128	128	128.33333	1320	1310	1300	1310	67.9	35	87.3	35	295	33	371	34	34
561	19/1/13	19/7/12	36	109	110	108	109	950	1000	925	958.33333	48.1	26	62.5	25	230	27	247	26	26
562	,,	1/6/2012	33	120	121	121	120.66667	1140	1170	1170	1160	61.1	32	79.3	31	287	33	300	33	32
563	,,	5/5/2012	37	145	150	150	148.33333	1510	1440	1550	1500	79.5	40	102	40	354	40	365	39	40
564	,,	21/7/12	26	110	100	98	102.66667	900	990	1000	963.33333	47.9	26	64.8	26	210	26	245	26	26
565	,,	12/9/2012	18	70.5	69.9	67.8	69.4	395	389	366	383.33333	28.4	18	38.2	17	125	18	125	18	17
566	,,	1/6/2012	33	134	134	135	134.33333	1440	1440	1450	1443.3333	65.4	34	81.7	33	268	31	300	33	32
567	,,	24/7/12	35	105	103	106	104.66667	869	840	900	869.66667	46.7	25	64.4	27	209	25	228	24	25
568	,,	5/9/2012	19	81.7	80.5	81.5	81.233333	532	515	529	525.33333	29.7	19	43.4	19	137	19	160	18	19
569	,,	18/8/12	22	100	101	99	100	800	790	803	797.66667	40.6	22	53.5	22	178	22	202	22	22
570	,,	22/9/12	17	70	70.7	70.2	70.3	376	418	339	377.66667	25	17	38	17	125.8	18	138	17	17
571	,,	10/7/2012	37	132	128	128	129.33333	1380	1310	1310	1333.3333	50.9	27	70.2	28	246	29	261	28	28
572	,,	5/10/2012	17	48.8	52.8	47.5	49.7	159	222	180	187	16.4	15	29.1	15	83.3	15	102	14	15
573	,,	16/10/12	16	52.3	43.2	54.6	50.033333	217	148	237	200.66667	18	14	25	14	79.7	14	94.3	14	14
574	'	6/10/2012	15	50.3	51	53	51.433333	200	230	197	209	15	15	31.5	16	89.6	15	111	15	15
575	,,	10/8/2012	23	94.4	93	92.4	93.266667	709	688	680	692.33333	43.5	24	54.8	23	178	23	216	23	23
576	21/1/13	17/5/12	35	145	143	143	143.66667	1650	1630	1630	1636.6667	67.2	35	82.4	33	296	34	315	35	34
577	,,	8/6/2012	32	128	124	129	127	1290	1220	1310	1273.3333	63.1	33	80.4	32	273	31	293	32	32
578	,,	20/6/12	30	126	124	125	125	1260	1220	1250	1243.3333	56.5	29	71.6	28	255	30	276	30	29
579	,,	5/9/2012	19	81.7	80.5	81.5	81.233333	532	515	529	525.33333	29.7	19	43.4	19	137	19	160	18	19
580	,,	19/7/12	26	109	110	108	109	950	1000	925	958.33333	48.1	26	62.5	25	230	27	247	26	26
581	,,	17/5/12	35	140	133	139	137.33333	1560	1410	1530	1500	67.2	35	83.6	33	318	36	316	35	34
582	,,	1/6/2012	33	136	133	134	134.33333	1480	1410	1420	1436.6667	72.3	37	93.7	38	327	37	328	37	37
583	'	8/10/2012	15	47.8	50.3	49	49.033333	180	190	181	183.66667	15	15	31.5	16	89.6	15	111	15	15
584	,,	17/4/12	39	145	145	145	145	1650	1650	1670	1656.6667	77.3	39	87.6	35	345	38	353	41	38
585	,,	3/6/2012	33	128	127	127	127.33333	1290	1280	1280	1283.3333	62.9	33	83.1	33	292	33	316	35	33
586	,,	1/6/2012	33	129	130	129	129.33333	1320	1340	1310	1323.3333	69.3	35	88.2	35	303	34	302	33	34
587	,,	2/7/2012	29	117	120	119	118.66667	1090	1130	1120	1113.3333	55.3	29	71.8	28	250	29	272	29	29
588	,,	23/4/12	39	136	136	135	135.66667	1490	1480	1430	1466.6667	77	40	95	38	330	38	356	40	40
589	,,	3/7/2012	28	117	120	119	118.66667	1080	1130	1120	1110	56.1	29	75.7	30	254	30	276	30	29
590	,,	7/5/2012	37	132	132	132	132	1380	1390	1380	1383.3333	73.8	37	93.9	38	337	38	338	38	37

591	,,	15/9/12	18	76.3	78.2	76.7	77.066667	463	486	468	472.33333	26.7	18	47.6	20	129	18	160	18	18
592	,,	4/6/2012	33	126	125	125	125.33333	1270	1250	1250	1256.6667	63.7	33	80.6	32	285	33	303	33	33
593	,,	26/4/12	38	145	145	145	145	1650	1650	1670	1656.6667	73.7	37	89.3	36	354	39	331	37	37
594	,,	15/6/12	31	129	128	129	128.66667	1320	1310	1310	1313.3333	61	31	78.7	31	251	29	294	32	31
595	,,	21/4/12	39	142	143	139	141.33333	1600	1630	1530	1586.6667	75.5	38	88.1	35	339	38	329	37	37
596	22/1/13	21/7/12	26	116	114	115	115	1070	1040	1060	1056.6667	48.7	26	64.2	26	211	26	248	26	26
597	5/11/2012	25/2/12	35	128	128	125	127	1290	1310	1250	1283.3333	77.3	39	96.8	39	353	39	345	39	39
598	,,	1/6/2012	33	128	124	129	127	1290	1220	1310	1273.3333	63.1	33	80.4	32	273	31	293	32	32
599	,,	4/6/2012	33	128	128	128	128	1290	1310	1280	1293.3333	63.7	33	82.5	33	289	33	304	33	33
600	,,	2/7/2012	29	125	123	121	123	1240	1210	1170	1206.6667	55.9	29	76.7	30	250	29	286	31	30
601	,,	8/8/2012	24	119	118	118	118.33333	1130	1100	1100	1110	47.2	26	64.3	25	198	24	222	24	25
602	25/1/13	3/8/2012	24	102	101	101	101.33333	821	811	813	815	45.2	25	61.5	24	208	25	222	24	24
603	,,	21/5/12	35	134	135	134	134.33333	1440	1450	1420	1436.6667	68.1	35	87.4	35	307	35	327	37	35
604	,,	25/6/12	30	124	122	124	123.33333	1220	1180	1220	1206.6667	58.8	30	76.5	30	255	30	279	30	30
605	,,	12/10/2012	15	61.1	62.9	62.9	62.3	297	314	314	308.33333	18	14	30	15	88	15	133	16	15
606	,,	26/7/12	26	105	102	102	103	869	821	822	837.33333	48	26	64.2	26	214	26	235	25	26
607	,,	6/9/2012	20	84.6	86.6	85.4	85.533333	570	596	580	582	33.1	20	47.5	20	146	20	172	19	20
608	,,	2/8/2012	25	110	110	110	110	959	1000	957	972	47	25	65.8	26	215	26	244	26	26
609	,,	7/9/2012	20	84.8	86.5	88.1	86.466667	600	680	655	645	32	20	53	20	150	19	178	20	20
610	,,	6/6/2012	33	130	131	130	130.33333	1340	1360	1330	1343.3333	63.4	33	80.3	34	293	33	291	32	33
611	,,	7/9/2012	20	89	85	88	87.333333	630	576	622	609.33333	36.7	22	46.7	20	175	22	187	22	21
612	,,	18/6/12	31	125	125	125	125	1240	1250	1250	1246.6667	60.6	31	77.7	31	259	30	286	31	31
613	26/1/13	24/8/12	22	95.8	96.6	97.4	96.6	731	742	755	742.66667	38.5	22	52.2	21	184	23	197	21	22
614	,,	23/6/12	31	118	118	118	118	1110	1100	1100	1103.3333	59.3	31	76.9	30	236	28	283	31	30
615	,,	15/4/12	40	140	140	140	140	1560	1550	1550	1553.3333	79.9	40	96.4	39	360	40	334	38	39
616	,,	7/9/2012	20	80.1	79.1	78.7	79.3	510	497	492	499.66667	32.9	20	45.1	19	152	20	176	20	19
617	,,	20/6/12	31	114	115	116	115	1040	1040	1080	1053.3333	59.6	31	75.5	30	261	30	275	30	30
618	,,	11/8/2012	25	92.5	105	100	99.166667	651	611	655	639	42.8	24	57.7	23	191	24	208	22	23
619	,,	6/10/2012	16	58.1	58.7	59	58.6	268	274	277	273	20.3	16	31.9	16	91.2	15	119	15	15
620	'	13/10/12	15	39.2	38.4	40.2	39.266667	122	120	126	122.66667	15	15	31.5	16	89.6	15	111	15	15
621	,,	22/9/12	18	75.6	73.5	75.5	74.866667	454	430	455	446.33333	27	18	40.6	18	120	18	144	17	18
622	,,	30/9/12	16	65.3	63.9	64.2	64.466667	339	325	328	330.66667	17.6	15	33.8	16	106	17	133	16	16
623	28/1/13	8/5/2012	37	138	138	137	137.66667	1500	1510	1490	1500	72.1	37	92	37	330	37	327	37	37

	18/5/12	36	139	136	141	138.66667	1530	1480	1570	1526.6667	70.3	36	89.8	36	309	35	325	36	36
	3/8/2012	25	94	94.1	94.1	94.066667	703	705	704	704	45.7	25	62.5	25	209	25	239	26	25
	2/9/2012	21	90.1	89.6	88	89.233333	645	639	622	635.33333	36.4	21	50.4	21	158	21	188	22	21
	16/6/12	30	134	134	135	134.33333	1440	1440	1450	1443.3333	61.6	32	78.8	31	278	32	285	32	31
	16/6/12	30	132	134	134	133.33333	1380	1440	1420	1413.3333	61.3	32	79.2	31	275	32	296	32	32
	10/6/2012	31	130	130	130	130	1340	1340	1330	1336.6667	63.1	33	81	32	265	31	299	32	32
	19/7/12	27	108	106	108	107.33333	923	891	925	913	51.3	27	67	27	231	27	254	27	27
	22/6/12	30	114	113	112	113	1040	1010	1000	1016.6667	60.8	31	78.2	31	264	31	295	32	31
9/1/13	1/6/2012	33	150	150	150	150	1780	1790	1780	1783.3333	69.4	35	85.7	34	302	34	318	35	34
	21/8/12	22	91.8	100	110	100.6	800	805	815	806.66667	41.3	23	55.8	23	177	23	205	22	23
	6/5/2012	37	152	151	152	151.66667	1830	1800	1830	1820	72.5	37	88.7	36	343	38	329	37	37
	17/6/12	31	122	124	123	123	1180	1220	1200	1200	61.4	32	79.6	32	283	32	305	34	32
	18/5/12	36	151	151	151	151	1820	1800	1810	1810	68.1	35	85.1	34	319	36	323	36	35
	3/9/2012	21	89	87.3	90	88.766667	630	607	654	630.33333	36.5	21	48.1	20	160	21	194	21	21
	27/5/12	34	136	137	137	136.66667	1480	1500	1490	1490	68.8	35	87.1	35	306	35	319	35	35
	9/10/2012	16	68.1	68.1	68.1	68.1	368	369	368	368.33333	20.4	16	32.4	16	108	17	125	18	16
	8/5/2012	37	154	154	154	154	1880	1870	1870	1873.3333	73.2	37	92.6	37	327	37	334	38	37
0/1/13	24/9/12	18	67.8	66.8	67.8	67.466667	366	335	366	355.66667	26.3	18	41.8	18	120	18	145	17	18
	27/9/12	18	65.3	65.3	65.3	65.3	339	339	339	339	26.5	18	39.1	17	110	17	141	17	17
	18/6/12	31	134	134	134	134	1440	1440	1440	1440	62.9	33	80.2	32	273	31	278	33	32
	25/4/12	40	145	150	150	148.33333	1510	1440	1550	1500	79.5	40	102	40	354	40	365	39	40
	29/5/12	34	134	132	135	133.66667	1440	1390	1450	1426.6667	67.1	35	82.6	33	301	34	313	35	34
	14/8/12	23	105	105	104	104.66667	869	883	858	870	43.2	24	60.1	24	193	24	224	24	24
	10/10/2012	16	55.1	53.8	56.6	55.166667	235	230	255	240	20	16	33.1	16	123	16	104	16	16
	6/6/2012	32	135	135	132	134	1450	1450	1380	1426.6667	66.3	34	81.7	33	292	33	321	36	34
	27/6/12	30	126	124	124	124.66667	1260	1220	1220	1233.3333	58.3	30	76.9	30	264	31	280	30	34
	16/7/12	27	102	102	102	102	821	821	822	821.33333	53.2	28	65.4	26	236	28	207	28	27
7/5/13	12-Jul	45	90	90.8	90.7	90.5	645	656	655	652	42	24	55.4	22	193	24	209	23	23
	7/12/2012	24	91	93.1	93.1	92.4	659	690	690	679.66667	42.2	24	58.2	23	187	23	217	23	23
	1/1/2013	21	82	82.5	79.6	81.4	535	543	504	527.33333	37.4	22	49.5	20	160	21	185	22	21
	7/12/2012	24	113	116	116	115	1030	1070	1080	1060	43.5	24	56.8	23	197	24	224	24	23
	15/12/12	23	102	102	103	102.33333	821	821	848	830	39.3	22	49.2	20	184	23	192	21	21
8/5/13	11/1/2013	20	87.2	84.4	88.4	86.666667	605	567	608	593.33333	29.2	19	45.3	19	143	20	180	20	19

657	,,	3/1/2013	22	88	83.3	82.9	84.733333	609	552	547	569.33333	35.7	21	47.9	20	160	21	182	20	20
658	29/5/13	5/11/2012	30	129	120	123	124	1320	1130	1200	1216.6667	57.1	30	72.7	29	246	29	279	30	29
659	,,	2/12/2012	25	110	108	113	110.33333	959	924	1010	964.33333	46.3	25	64.3	25	210	26	232	25	25
660	,,	11/12/2012	24	97.8	95.3	96.6	96.566667	761	722	742	741.66667	38.6	22	54.6	22	193	24	202	22	22
661	30/5/13	2/11/2012	30	114	113	111	112.66667	1040	1010	976	1008.6667	58.9	30	76	30	257	30	297	32	30
662	,,	17/1/13	19	86.9	96	83	88.633333	559	600	554	571	30.9	19	45.7	19	145	19	166	19	19
663	,,	3/1/2013	21	95.3	94.3	93.2	94.266667	720	715	720	718.33333	34.3	21	35	21	160	21	190	21	21
664	,,	1/2/2013	17	72.9	75.4	75.6	74.633333	423	452	454	443	24.7	17	34.4	16	109	17	129	16	17
665	'	14/2/13	15	39.2	38.4	40.2	39.266667	122	120	126	122.66667	15	15	31.5	16	89.6	15	111	15	15
666	,,	9/1/2013	20	94.1	84.2	90.5	89.6	704	565	653	640.66667	33.1	20	47.8	20	152	20	172	19	20
667	,,	15/1/13	20	100	95.1	102	99.033333	801	720	822	781	30.7	19	45.7	19	150	20	168	19	20
668	,,	27/12/12	25	113	116	103	110.66667	1030	1070	848	982.66667	47.1	26	59.6	24	195	24	230	25	25
669	,,	12/12/2012	24	95.8	94	93.1	94.3	731	703	690	708	43	24	64	25	192	24	230	25	24
670	,,	14/11/12	28	120	120	123	121	1150	1130	1200	1160	52.8	28	68.5	27	243	29	271	29	28
671	,,	29/9/12	38	121	127	125	124.33333	1170	1280	1250	1233.3333	77.2	39	96.6	38	350	39	334	38	38
672	,,	17/12/12	22	105	96.8	102	101.26667	869	746	822	812.33333	41.5	23	54.7	22	186	23	202	22	22
673	,,	20/8/12	40	164	165	146	158.33333	2130	2160	1690	1993.3333	78.1	40	101	41	346	39	349	40	40
674	,,	28/2/13	13	50.6	53.2	51.3	51.7	220	210	230	220	16.9	14	29	14	82.1	14	96.6	14	14
675	,,	5/12/2012	25	110	107	108	108.33333	959	916	925	933.33333	49.1	26	60.2	24	206	25	231	25	25
676	,,	31/1/13	17	70	72	68.7	70.233333	380	417	340	379	25	17	39	17	126	18	136	17	17
677	,,	31/1/13	17	72	72	72	72	384	410	340	378	26	17	38	17	124	18	137	17	17
678	,,	24/1/13	18	71.3	74	71.9	72.4	384	412	337	377.66667	25	17	40	17	122	18	139	17	17
679	,,	1/3/2013	14	45	43	47	45	203	200	190	197.66667	14	14	25.6	14	83.5	15	99.1	14	14
680	'	13/09/12	37	139	140	131	136.66667	1490	1550	1480	1506.6667	80.6	41	102	42	361	40	356	41	40
681	31/5/13	23/11/12	27	120	117	116	117.66667	1146	1086	1091	1107.6667	52.1	27	68.3	27	223	27	260	27	27
682	,,	23/11/12	27	120	120	120	120	1138	1100	1080	1106	53.2	27	69	27	225	27	262	27	27
683	,,	23/11/12	27	108	107	107	107.33333	940	891	930	920.33333	50.8	27	67	27	231	27	254	27	27
684	,,	28/09/12	35	157	151	153	153.66667	1935	1900	1800	1878.3333	76.5	39	91.8	37	360	40	347	40	39
685	,,	14/9/12	37	160	150	145	151.66667	1900	1900	1900	1900	75.5	39	92.7	37	364	40	389	40	39
686	,,	21/4/12	38	125	125	125	125	1290	1240	1250	1260	77	39	98	39	350	39	348	39	39
687	,,	25/1/13	18	75.6	73.5	75.5	74.866667	454	430	455	446.33333	27	18	40.6	18	120	18	144	17	18
688	,,	28/12/12	22	101	100	97.6	99.533333	799	800	800	799.66667	40.2	22	54	22	178	22	197	22	22
689	,,	16/11/12	28	120	120	123	121	1150	1130	1200	1160	52.8	28	68.5	27	243	29	271	29	28

690	,,	7/9/2012	38	145	150	150	148.33333	1510	1440	1550	1500	79.5	40	102	40	354	40	365	39	40
691	,,	8/2/2013	16	63	63.8	60.2	62.333333	306	314	290	303.33333	22	16	36	17	104	16	129	16	16
692	,,	5/10/2012	34	137	136	136	136.33333	1490	1480	1470	1480	4.6	33	82.7	33	305	34	309	34	33
693	,,	24/8/12	40	147	148	147	147.33333	1490	1410	1485	1461.6667	77.9	40	102	40	334	40	370	40	40
694	1/6/2013	22/12/12	23	105	105	104	104.66667	869	883	858	870	43.2	24	60.1	24	193	24	224	24	24
695	,,	12/1/2013	19	89	85	88	87.333333	630	576	622	609.33333	36.7	22	46.7	20	175	22	187	22	21
696	'	16/02/13	15	39.2	38.4	40.2	39.266667	122	120	126	122.66667	15	15	31.5	16	89.6	15	111	15	15
697	,,	6/10/2012	34	136	137	137	136.66667	1480	1500	1490	1490	68.8	35	87.1	35	306	35	319	35	35
698	'	5/1/2013	21	93.1	93.3	97.7	94.7	690	693	760	714.33333	48.6	26	64.3	25	212	26	244	26	26
699	'	9/2/2013	16	72.8	75.4	73.4	73.866667	422	452	426	433.33333	28.4	18	42	18	132	19	150	18	18
700	,,	27/10/12	31	114	115	116	115	1040	1040	1080	1053.3333	59.6	31	75.5	30	261	30	275	30	30
701	,,	3/11/2012	30	113	108	114	111.66667	1030	924	1030	994.66667	56	29	74.5	29	251	29	280	30	29
702	,,	1/12/2012	22	95.8	96.6	97.4	96.6	731	742	755	742.66667	38.5	22	52.2	21	184	23	197	21	22
703	,,	26/1/13	18	65.3	65.3	65.3	65.3	339	339	339	339	26.5	18	39.1	17	110	17	141	17	17
704	,,	19/1/13	19	91.3	90.8	93	91.7	548	534	534	538.66667	31.6	19	49	20	149	19	175	20	19
705	,,	5/1/2001	21	89	87.3	90	88.766667	630	607	654	630.33333	36.5	21	48.1	20	160	21	194	21	21
706	,,	3/11/2012	30	108	113	106	109	923	1010	900	944.33333	54.6	29	67.4	27	243	29	257	28	28
707	,,	29/12/12	22	105	96.8	102	101.26667	869	746	822	812.33333	41.5	23	54.7	22	186	23	202	22	22
708	,,	8/12/2012	23	105	107	106	106	869	916	900	895	45.3	25	60.9	24	203	25	229	25	25
709	,,	15/12/12	24	97	96.2	96.6	96.6	749	736	742	742.33333	46.8	25	60.5	24	205	25	223	24	24
710	'	12/1/2013	20	109	102	99.8	103.6	790	800	810	800	43.3	24	55.7	23	198	24	212	23	23
711	'	9/3/2013	12	72.8	75.4	73.4	73.866667	422	452	426	433.33333	28.4	18	42	18	132	19	150	18	18
712	'	16/2/13	15	68.5	67.8	73.9	70.066667	369	366	435	390	32.4	20	44.9	19	143	20	173	19	19
713	'	5/1/2013	21	93.2	102	102	99.066667	691	821	822	778	44.4	24	54.6	22	198	24	212	23	23
714	,,	12/1/2013	20	91.2	88.4	93.9	91.166667	660	620	701	660.33333	35.7	21	47.6	20	162	22	175	20	20
715	,,	10/11/2012	29	113	113	113	113	1030	1010	1020	1020	53.8	28	70.7	28	235	28	263	28	28
716	,,	10/11/2012	29	111	107	106	108	957	916	900	924.33333	50.8	27	63	25	209	25	238	25	25
717	,,	29/12/12	22	105	96.8	102	101.26667	869	746	822	812.33333	41.5	23	54.7	22	186	23	202	22	22
718	3/6/2013	19/11/12	28	120	110	115	115	1030	1060	1054	1048	54	29	68	27	237	28	258	28	28
719	,,	3/12/2012	26	110	102	109	107	889	930	930	916.33333	48.3	26	64.3	26	211	26	243	26	26
720	,,	27/8/12	40	160	165	150	158.33333	1990	2010	1850	1950	79	40	98	40	346	39	350	40	40
721	,,	18/3/13	15	55	56	50	53.666667	220	200	201	207	18	14	29	15	79.6	14	95.6	14	14
722	,,	14/1/13	20	86	79.9	87.9	84.6	630	690	700	673.33333	32	20	54.3	20	159	20	160	21	20

723	,,	7/1/2013	21	95.3	94.3	93.2	94.266667	720	715	720	718.33333	34.3	21	35	21	160	21	190	21	21