**Rakhimova G. G.** (Tashkent, Uzbekistan) — **Sequential estimation of functionals of an unknown multivariate distribution function by fixed-width confidence intervals.**

Consider on (Ω, F, P) $m$ dimensional random vectors $\xi_1, \xi_2, ..., \xi_n$ with unknown distribution function $F(x), x = (x_1, x_2, ..., x_m) \in R_m, \in F$, where $F$ is family of $m$ dimensional distributions functions, that meet certain conditions regularity. To estimate the functional $\theta(F)$ of distributions functions $F(x)$ consider consistency estimator $\theta_n(F) = \theta_n(\xi_1, \xi_2, ..., \xi_n)$, which is decomposed

$$\theta_n(F) = \theta(F) + [\theta_n(F) - E(\theta_n(F))] + [E(\theta_n(F)) - \theta(F)] = \theta(F) + \sum_{k=1}^{n} Y_n(F, \xi_k) + Z_n,$$

where the values $Y_n(F, \xi_k)$, $1 \leq k \leq n$ and $Z_n$ such that, there are the numbers $\alpha > 0$ and $\sigma^2(F) > 0$, that $n^\alpha \sum_{k=1}^n Y_n(F, \xi_k)$ is asymptotically normal with mean 0, dispersion $\sigma^2(F)$ and $n^\alpha Z_n \longrightarrow 0$ in $n \to \infty$. Let $V_n^2 = V_n^2(\xi_1, \xi_2, ..., \xi_2)$ be a consistency estimate for $\sigma^2(F)$ and $0 < \gamma < 1$, $a = \Phi^{-1}\left(\frac{1+\gamma}{2}\right)$, $\varepsilon > 0$. Consider random stopping time $N_\varepsilon = \inf\left(n \geq 1 : n \geq \left(\frac{a^2 V_n^2}{\varepsilon^2}\right)^{\frac{1}{2\alpha}}\right)$. Obtained conditions for the asymptotic consistency of the fixed-width confidence interval $I(N_\varepsilon) = [\theta_{N_\varepsilon}(F) - \varepsilon, \theta_{N_\varepsilon}(F) + \varepsilon]$, $\varepsilon > 0$ for $\theta(F)$ and for the asymptotic efficiency in the sense of Chow and Robbins (see [1]) of the stopping time $N_\varepsilon$. As an example obtained conditions for the asymptotic consistency of the fixed-width confidence intervals for a derivative of multivariate probability density function.

REFERENCES


1. *Y.S.Chow, H.Robbins.* On the asymptotic theory of fixed-width sequential confidence intervals for the mean, Ann. Math. Statist., 1965, т. 36, pp 457-462.